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WOODWARD-CLYDE CONSULTANTS PLYMOUTH MEETING PA
NATIONAL DAM INSPECTION PROGRAM. SAW MILL DAM (NDS ID PA 00324 --ETC(U)
MAY 79

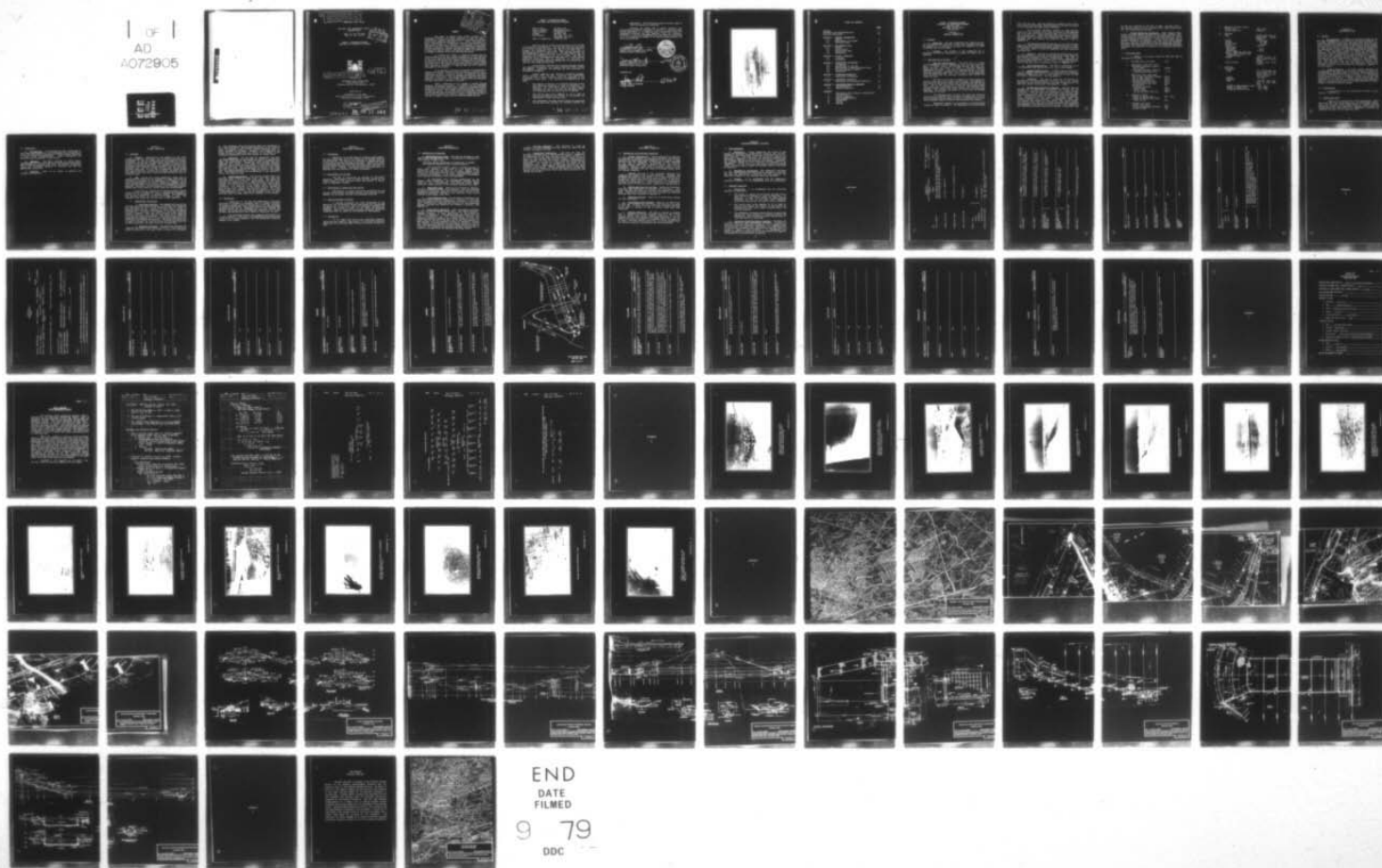
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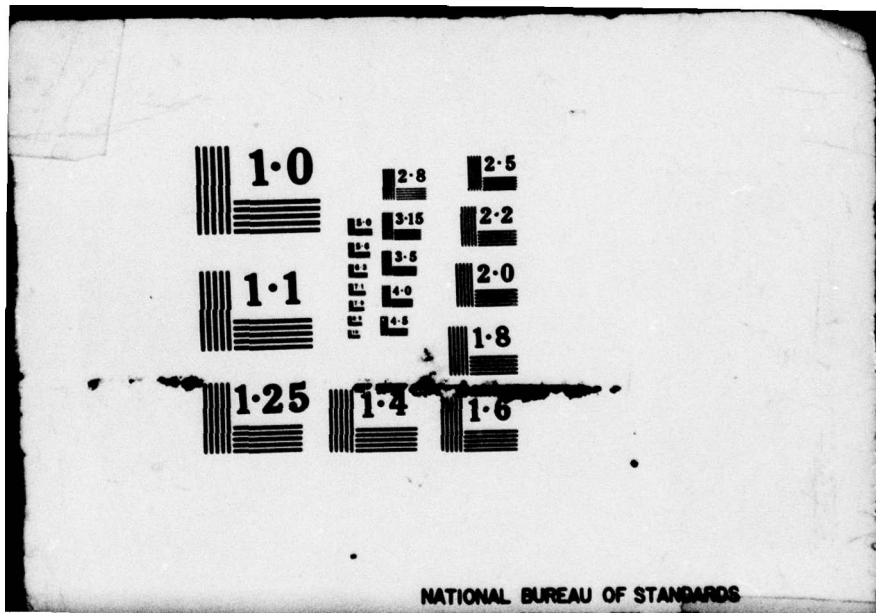
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Delaware River Basin, Saw Mill Creek,
Montgomery County, Pennsylvania. Phase
I Inspection Report.

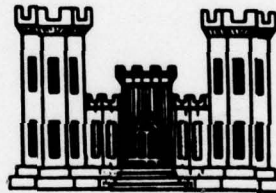
DELAWARE RIVER BASIN

SAW MILL DAM, MONTGOMERY COUNTY
PENNSYLVANIA

NDS I.D. NO. PA 00324
DER I.D. NO. 46-261



PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM



15 DACW31-79-C-0017

Prepared by:

WOODWARD-CLYDE CONSULTANTS
5120 Butler Pike
Plymouth Meeting, Pennsylvania 19462

Submitted to:

DEPARTMENT OF THE ARMY
Baltimore District, Corps of Engineers
Baltimore, Maryland 21203

11 MAY 79

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PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams for Phase I Investigations. Copies of these guidelines may be obtained from the Office of the Chief of Engineers, Washington, D. C., 20314. The purpose of a Phase I investigation is to expeditiously identify those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify the need for more detailed studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected, and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the spillway design flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. The spillway design flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

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PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

Name of Dam:	Saw Mill Dam
County Located:	Montgomery County
State Located:	Pennsylvania
Stream:	Saw Mill Run
Coordinates:	Latitude 40° 7.5' Longitude 75° 19.3'
Date of Inspection:	28 March 1979

Saw Mill Dam is owned and maintained by the Borough of Norristown, Pennsylvania. The dam and reservoir are used as a flood control structure for Saw Mill Run Watershed to protect the residents who live below Saw Mill Run in downstream portions of Norristown. The dam was designed by the Pennsylvania State Authority in the early 1960's, and the structure was completed in the fall of 1968. The dam is classified as an "Intermediate" size dam with a "High" hazard potential consistent with its potential, in the event of failure, for extensive property damage and the probability of loss of life along Saw Mill Run.

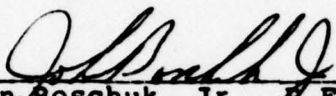
Calculations indicate the existing spillway systems are capable of passing the Probable Maximum Flood without overtopping. Therefore, the spillway for this structure is considered "Adequate".

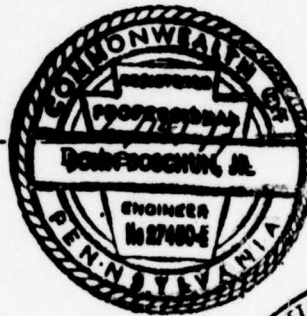
Visual inspection and review of available documentation indicate that the dam, foundation and appurtenant structures are in good condition with the exception of the inoperable sluice gate. The following recommendations are made:


1. The engine to operate the principal spillway sluice gate should be replaced as soon as practical. In addition, the hand crank should be made readily available for use in the event an emergency condition develops and the engine fails to operate.
2. The sluice gate hoist appears to be in need of general maintenance and should be lubricated and exercised at least once per year.
3. The embankment drainage system should be monitored during and after periods of retention behind the

embankment. This monitoring should include rates of flow and checks on turbidity.

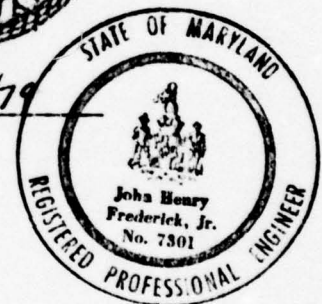
Although the Owner has a formal operation and maintenance procedure including a section on warning downstream residents, it is apparent from conversations that the responsible persons are not familiar with its contents. Therefore, it is also recommended that the staff be instructed as to the contents and usage of the operation/maintenance and warning procedures.


John Boschuk, Jr., P.E.
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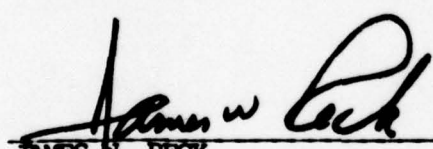



John H. Frederick, Jr., P.E.
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Woodward-Clyde Consultants

6/14/79
Date



APPROVED BY:


JAMES V. PECK
Colonel, Corps of Engineers
District Engineer

17 July 79
Date



OVERVIEW
SAW MILL DAM, MONTGOMERY COUNTY, PENNSYLVANIA

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PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM
SAW MILL DAM
NATIONAL ID #PA 00324
DER #46-261

SECTION 1
PROJECT INFORMATION

1.1 General.

a. Authority. The Dam Inspection Act, Public Law 92-367, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a program of inspection of dams throughout the United States.

b. Purpose. The purpose of the inspection is to determine if the dam constitutes a hazard to human life or property.

1.2 Description of Project.

a. Dam and Appurtenances. Saw Mill Dam is a zoned earth embankment with an impervious core, an outer pervious shell, a cutoff trench and drainage blanket and rock toe. These features are shown on Plate 3, entitled "Typical Embankment Sections". The dam is approximately 1,335 feet long and the height, measured from the crest to the principal spillway discharge pipe inlet, is 47 feet. Borrow materials were obtained from the spillway excavation and within the reservoir area.

The core of the dam is composed of clayey materials derived from the borrow areas, and the shell is composed of more pervious materials selectively excavated from the borrow pits. The 10 foot wide cutoff trench has 1H:1V side slopes and a grout cap at the base of the trench. The foundation was grouted using a single line grout curtain with six foot hole spacings. The average hole depth is 15 feet and the maximum hole depth is 30 feet.

The upstream slope is 3H:1V, the lower two-thirds of the slope is protected with 18 inches of riprap over a 12-inch filter blanket and the upper portion is protected with grass. The downstream slope is 2.5H:1V and protected with grass.

Embankment seepage is controlled by a blanket drain located as shown on Plate 3. The embankment drain discharges

into the rock toe. The toe contains a gravel filled trench drain which collects water and discharges it through the walls of the principal spillway outlet structure.

The principal spillway, located at approximately Station 6 + 60, consists of an inlet structure at the upstream toe, a 78-inch reinforced concrete pipe, an outlet structure and a plunge pool. There are five anti-seep collars around the pipe, which is gated at the downstream end. The principal spillway plan and profile are shown on Plates 2 and 5, Appendix E.

The emergency spillway consists of a curved concrete ogee weir, chute and stilling basin discharging into a rock-lined channel paralleling Fornance Street, as shown on Plate 2. The weir, shown on Plate 7b, measures 126 feet along its upstream face.

b. Location. The dam is located on Saw Mill Run, near the intersection of Fornance Street and Green Valley Road, in Norristown, Montgomery County, Pennsylvania. The site is shown on USGS Quadrangle entitled "Norristown, Pennsylvania" at coordinates N 40° 7.5' W 75° 19.3'. A regional location plan of Saw Mill Dam is enclosed as Plate 1, Appendix E.

c. Size Classification. The dam is classified as an "Intermediate" size dam by virtue of its 47 foot height.

d. Hazard Classification. A "High" hazard classification is assigned consistent with the potential for extensive property damage and loss of life along the stream through Norristown, Pennsylvania. See Photograph 9.

e. Ownership. The dam is owned by the Borough of Norristown. All correspondence should be sent to Mr. Joseph Bouchard, Acting Borough Engineer, Borough of Norristown, 235 East Airy Street, Norristown, Pennsylvania 19401.

g. Design and Construction History. Saw Mill Dam was designed by the Department of Forests and Waters for the Pennsylvania General State Authority as a flood control structure. Test borings were performed from October 1964 through January 1965, and the application submitted September 1966. Construction began in the spring of 1967 by Glasgow, Inc., contractors for the State. Mr. Edward Shober was resident engineer for the State. By December 8, 1967, when the project was halted for the winter, the cutoff trench, grouting and grout cap, and principal spillway were completed and embankment fill placed to elevation 118. Fill operations and emergency spillway construction resumed in May 1968, and

the dam was completed by the fall of 1968. By April 1973, a new heavier trash rack was installed and a block house built over the downstream sluice gate.

h. Normal Operating Procedures. Under normal conditions, all water passes through the principal spillway inlet discharging into the plunge pool at the downstream toe. Water is not normally stored behind the structure and there are no minimum discharge requirements. During flood flows, excess water is stored up to elevation 142, the top of the emergency spillway, and then discharged through the emergency spillway. Pertinent elevations pertaining to the principal and emergency spillways are tabulated in Section 1.3, entitled "Pertinent Data".

1.3 Pertinent Data.

A summary of pertinent data for Saw Mill Dam is presented as follows.

a.	Drainage Area (sq miles)	3.92
b.	Discharge at Dam Site (cfs)	
	Emergency Spillway (water at top of dam)	16,900
	Principal Spillway (water at emergency spillway crest)	1,135
c.	Elevation (feet above MSL)	
	Top of Dam (including chamber)	153.5
	Top of Dam (design)	153.0
	Top of Impervious Core	145.0
	Emergency Spillway Crest	142.0
	Stilling Basin End Sill	104.0
	Normal Pool	Dry
	Principal Spillway	
	Inlet Invert	106.5
	Outlet Invert	106.0
	Outlet Structure End Sill	108.5
d.	Reservoir (feet)	
	Length at Normal Pool	N/A - Dry
	Length at Design High Water (elev 153.0)	N/A
e.	Storage (acre-feet)	
	Normal Pool (dry)	0.0
	Crest of Emergency Spillway	390
	At Top of Dam	740

f.	Reservoir Surface (acres)	
	Normal Pool	N/A - Dry
	Design High Water	Unknown
g.	Dam Data	
	Type	Zoned earth fill w/ downstream filter blanket.
	Length	1,335 feet
	Height	47 feet
	Crest Width	20 feet
	Volume	Unknown
	Side Slopes	
	Upstream	3H:1V
	Downstream	2.5H:1V
	Berms - Upstream Slope Has	
	Access Road - Width (one	
	travelled lane)	Varies
	Cutoff	Cutoff trench; 10' base width w/ 1H:1V slopes.
	Grout Curtain	Single line grout curtain.
h.	Spillway	
	Principal	
	Type	78" reinforced con- crete pipe with 78" sluice gate at out- let structure.
	Length	220 feet
	Emergency	
	Type	Concrete ogee sec- tion at left abut- ment.
	Length of Upstream Weir Face	126 feet
	Length of Ogee Crest	123.2 feet
	Discharge Channel Width	70 feet

SECTION 2 ENGINEERING DATA

2.1 Design.

a. Availability. A summary of engineering data for Saw Mill Dam is presented in the checklist attached as Appendix A. Principal documents containing pertinent data used for this report include the "Report Upon the Application of the General State Authority and the Borough of Norristown" dated November 15, 1966, by the State of Pennsylvania, inspection reports and the application to construct the embankment dated September 7, 1966. Other documents include 15 sheets of construction drawings, several photographs and miscellaneous letters. State files were searched by State employees for the inspection team and documents pertaining to stability analysis, grouting and other miscellaneous features of the embankment were duplicated and given to the inspection team for their use. The available data was sufficient to evaluate the principal features of the dam and appurtenant structures. Selected portions of the drawings are included in Appendix E of this report.

b. Design Features. Principal design features are illustrated on the plan, profile and cross-section plates of the embankment and appurtenant structures. These features are enclosed in Appendix E as Plates 2 through 7. A description of the design features is presented in Section 1.2 entitled "Description of Project". Under normal conditions, the reservoir is dry and the gated principal spillway affords a means of controlling the rate of flow downstream during severe storms to minimize property damage.

2.2 Construction.

A description of the construction history is presented in Section 1.2.

2.3 Operational Data.

There are no operational records maintained. There are no minimum flow requirements for the downstream channel. There are no water level measurements or rainfall records maintained within this watershed. However, staff gages are located along the right side of the embankment to monitor the elevation of water in the reservoir area.

2.4 Evaluation.

a. Availability. All engineering data reproduced in this report and studied for this investigation was provided by either the Pennsylvania Department of Environmental Resources or other State representatives. Other information was obtained from the Borough of Norristown.

b. Adequacy. The data included in State files, supplemented with data obtained from the Borough of Norristown and information received from State and Borough representatives, was considered adequate to evaluate the dam and appurtenant structures.

c. Validity. There is no reason to question the validity of this data.

SECTION 3 VISUAL INSPECTION

3.1 Findings.

a. General. Observations and comments of the field inspection team are contained in the checklist enclosed herein as Appendix B, and are summarized and evaluated as follows. In general, the dam and its appurtenant facilities are in good condition and well maintained. The Borough of Norristown's maintenance employees periodically inspect and maintain this structure and routinely remove debris from the principal spillway trash rack. At the time of inspection, normal stream flow was discharging through the principal spillway and the maintenance crew was onsite removing trash and debris from the reservoir area.

b. Dam. During the visual inspection, there were no indications of distortion in alignment or grade that would be indicative of movement of the embankment or foundation. As no water was impounded at the time of inspection, seepage through the drainage blanket and toe drain was not expected nor was it observed. Therefore, the performance of the internal drainage system under high reservoir levels could not be evaluated.

There were no indications of surface cracks, unusual distortions at or beyond the toe or significant sloughing or erosion of the embankment or abutment slopes. The downstream and upstream slopes are covered with grass or rock. The vegetation was dense and the rock was in good condition.

c. Appurtenant Structures.

1. Principal Spillway. The exposed portions of the principal spillway inlet and outlet structures were inspected and evaluated to be in good condition with no signs of concrete deterioration, spalling or other major structural deficiencies. As shown in Photograph 1, the inlet structure contains a massive trash rack which collects trash requiring frequent cleaning. The interior pipe could not be inspected as it was not readily accessible. The sluice gate hoist was inspected and assessed to be in fair condition needing paint, lubrication and general maintenance. The gasoline engine used to operate the gate was recently stolen and the hand crank was missing; therefore, the gate could not be exercised.

2. Emergency Spillway. The emergency spillway was inspected and found to be in good condition. There was minor concrete spalling on the ogee crest, as shown in Photograph

12. The discharge chute and stilling basin are considered to be in good condition. The channel downstream of the stilling basin is somewhat silted in and contains stagnant water in which cattails are growing. However, this vegetation and slight siltation would have very little if any effect on the discharge characteristics of the channel for large flows.

d. Reservoir. At the time of inspection, the main impoundment area was dry and stable and used as a recreational area. The slopes within the reservoir area are moderate, well vegetated and stable. There was only minimum siltation observed, which would have no effect on flood water storage. There is some minor bank undercutting of Saw Mill Run within the reservoir area. The accumulation of debris in the trash rack has caused aggradation of (deposits within) the stream bed. Considerable debris had accumulated on the embankment within the reservoir area.

e. Downstream Channel. The natural channel below the Fornance Street bridge is rocky with a four foot high left bank and about a 13 foot high right bank. The banks are covered with trees and brush. Approximately 0.6 mile below the dam, the channel enters a 20 foot by 13 foot culvert which reduces to a 12 foot by 9 foot section under the Borough buildings. The condition of the tunnel was not checked as part of this work. Before entering this culvert, the stream passes under five bridges. The valley gradient in this area is approximately 0.01. The dam is located within an urban area and there are many houses built adjacent to the stream.

3.2 Evaluation.

Inspection of the dam and appurtenant facilities disclosed no evidence of apparent past or present movement that would indicate existing instability of the dam, principal or emergency spillways. The interior portion of the principal spillway could not be inspected due to flow through the system. The sluice gate was inspected, observed to be in need of minor maintenance work and a means of operating the gate.

The discharge channel was inspected and found to be in good condition. Similarly, the emergency spillway was also found to be in good condition and the downstream discharge channel to be stable.

SECTION 4 OPERATIONAL PROCEDURES

4.1 Procedures.

Operation of the dam does not require a dam tender. All flow discharges directly through the principal spillway and downstream. The dam is also designed to impound water by closing the principal spillway sluice gate. Excess flow would be discharged over the emergency spillway. There are written operational/maintenance and warning procedures available at Borough Hall. However, representatives contacted were unfamiliar with the contents of these procedures.

4.2 Maintenance of the Dam.

The dam is maintained by Borough of Norristown employees. Maintenance work includes periodic mowing of the grass, repair of the upstream riprap and removal of debris from the embankment slopes.

4.3 Maintenance of Operating Facilities.

Maintenance of these facilities performed by the Borough of Norristown includes cleaning trash from the intake system, the principal spillway and emergency spillway.

4.4 Warning Systems In Effect.

A warning procedure has been documented in the operation and maintenance manual describing how downstream residents are to be warned and what emergency measures and equipment are needed on hand in the event an emergency develops. However, responsible personnel contacted during the inspection were not aware of the contents of this manual.

4.5 Evaluation.

It is judged that the current operating procedure, which does not require a dam tender, is a realistic means of operating the relatively simple control facilities at Saw Mill Dam.

SECTION 5 HYDROLOGY/HYDRAULICS

5.1 Evaluation of Features.

a. Design/Evaluation Data. This dam was designed to pass the Probable Maximum Flood (PMF). According to a February 14, 1966, letter in DER files:

"Spillway design discharge (no freeboard) is 18,800 cfs (maximum probable storm, weather bureau)."

The watershed is small, about 3.3 miles long and 1.2 miles wide, having a total area of 3.92 square miles. Elevations range from 360 feet in the upper reaches to 106 feet at the principal spillway inlet. The watershed is about 75 percent residential. It is likely residential development will continue to develop within the watershed.

In accordance with criteria established by the Federal (OCE) Guidelines, the recommended spillway design flood for this "Intermediate" size dam and "High" hazard potential classification is the Probable Maximum Flood (PMF).

b. Experience Data. There are no records of reservoir levels or rainfalls within this watershed. The only estimate of previous high water level was "a foot below the top of the basketball backboard" located in the reservoir level during Tropical Storm Agnes, June 1972.

c. Visual Observations. On the date of inspection, the only condition observed indicating a reduction in principal spillway capacity was the accumulation of debris in the trash rack. Observations regarding the condition of the downstream channel, spillway and reservoir are located in Section 3 and Appendix B.

d. Overtopping Potential. The overtopping potential of this dam was estimated using "HEC-1, Dam Safety Version", computer program. A brief description of the program is included in Appendix C. The computed PMF peak inflow is 9,993 cfs. Calculations for this investigation estimate the emergency spillway capacity to be about 16,900 cfs with the water level at the top of the dam. As the spillway capacity is much greater than the computed inflow, no reservoir routing was required to determine the overtopping potential of this dam. The estimated maximum reservoir level during the PMF is elevation 150 (assuming no principal spillway discharge and no reservoir storage below the emergency spillway crest).

e. Spillway Adequacy. The spillway is rated as "Adequate" as the emergency spillway alone can pass the PMF without overtopping the dam.

f. Downstream Conditions. Saw Mill Run Dam was designed to protect part of downstream Norristown. Immediately downstream of the dam, Saw Mill Run passes through a 20 foot by 13 foot bridge under Fornance Street. About 0.6 miles below the dam, Saw Mill Run enters a conduit, Photograph 14, which reduces to 12 feet by 9 feet under Norristown Borough Buildings. The stream is enclosed to its outlet at the Schuylkill River. Homes and the Municipal Building are built adjacent to the stream. Damage, including loss of life, would be significantly greater if the dam failed during the PMF than damage resulting from high flows just before failure of the dam during the PMF.

SECTION 6 STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability.

a. Visual Observations. Visual observations detected no evidence of existing or pending embankment instability. Upstream and downstream slopes appeared to be stable, in good condition and well vegetated. As there was no water impounded at the time of inspection, performance of the internal drainage system under high reservoir levels could not be evaluated. However, there were no exterior signs or other evidence to indicate that the internal drainage system would not operate properly.

Exposed portions of the principal spillway were inspected and judged to be in good condition. Likewise, the emergency spillway was also found to be in good condition with no signs of significant structural deterioration. A few minor cracks were noted along the retaining walls of the spillway, as shown in Photograph 11. These cracks are not expected to have any effect on the structural integrity of the structure.

b. Design and Construction Data. Design and construction data was sufficient to evaluate the structure. Such items included the stability analyses and foundation grouting data. Construction drawings were also reviewed and selected drawings have been enclosed in Appendix E.

c. Operating Records. There are no operational records for this structure.

d. Post-Construction Changes. There are no reports nor is there any evidence that any major modifications were made to this dam. A block structure over the principal spillway sluice gate to protect it and a heavier trash rack were installed.

e. Seismic Stability. The dam is located in Seismic Zone 1. Normally it can be considered that if a dam in this zone is stable under static loading conditions, it can be assumed safe for any expected earthquake conditions. As the stability analysis resulted in a minimum factor of safety of at least 1.59 under normal conditions, it can be assumed that the seismic stability requirements are also satisfied.

SECTION 7
ASSESSMENT/REMEDIAL MEASURES

7.1 Dam Assessment.

a. Evaluation. Visual inspection and review of the design and construction documentation indicate that the dam, foundation and appurtenant structures of Saw Mill Dam are in good condition. The hydrologic and hydraulic computations presented in Appendix C indicate that the structure will pass the Probable Maximum Flood without overtopping. Therefore, the spillway system for this structure is considered to be "Adequate". In the event the dam fails during an extreme event, extreme property damage and probable loss of life would be expected.

b. Adequacy of Information. The information available for this investigation was sufficiently adequate to evaluate the dam and appurtenant structures and the hydraulic and hydrologic aspects of the drainage basin and spillway.

c. Urgency. It is recommended that the suggestions presented in Section 7.2 be implemented as soon as practical.

7.2 Remedial Measures.

a. Facilities. It is recommended that the following measures be undertaken.

1. The engine to operate the principal spillway sluice gate should be replaced as soon as practical. In addition, a hand crank should be made readily available for use in the event that emergency conditions develop and the engine fails to operate.
2. The sluice gate hoist appears to be in need of general maintenance and should be lubricated and exercised at least once a year to assure that it is working properly.
3. The embankment drainage system should be monitored during and after periods of retention behind the embankment. This monitoring should include rates of flow and checks on turbidity.

b. Operation and Maintenance Procedures. The Owner has a formal operation and maintenance procedure, including a section on warning downstream residents. It is apparent from conversations with personnel responsible for implementation of the warning procedure that they were not familiar with its contents. Based on these findings, it is recommended that proper personnel be instructed as to the contents and usage of the operation and maintenance procedures.

APPENDIX

A

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

NAME OF DAM Saw Mill Dam
ID # PA 00324

Sheet 1 of 4

REMARKS

Design drawings were available and documentation in DER files indicates that the dam and appurtenant structures were built in accordance with the drawings.

ITEM

AS-BUILT DRAWINGS

REGIONAL VICINITY MAP

See Plate 1, Appendix E.

CONSTRUCTION HISTORY

See Section 1.2, paragraph "g" of text.

TYPICAL SECTIONS OF DAM

See Appendix E.

OUTLETS - PLAN

DETAILS

See Appendix E.

CONSTRAINTS

DISCHARGE RATINGS -- -- *See Appendix C.*

RAINFALL/RESERVOIR RECORDS -- --

None. The largest storm within this watershed occurred in June, 1972, Hurricane Agnes.

ITEM	REMARKS
DESIGN REPORTS	<i>None available in DER or Owner files. Design data is contained in GSA files in Harrisburg, Pennsylvania.</i>
GEOLOGY REPORTS	<i>None available in DER or Owner files. Geologic data is contained in GSA files in Harrisburg, Pennsylvania.</i>
DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	<i>Not available in DER or Owner files. Documentation is located in GSA files in Harrisburg, Pennsylvania.</i>
MATERIALS INVESTIGATIONS BORING RECORDS (1) LABORATORY FIELD	<i>Not available in DER or Owner files. (1) Drawings contain boring logs.</i>
POST-CONSTRUCTION SURVEYS OF DAM	<i>-- None.</i>
BORROW SOURCES	<i>-- Fill obtained from reservoir area.</i>

ITEM	REMARKS
MONITORING SYSTEMS	None.
MODIFICATIONS	None.
HIGH POOL RECORDS	None available.
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None.
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	None.
MAINTENANCE OPERATION RECORDS	None.

ITEM	REMARKS
SPILLWAY PLAN	
SECTIONS	
DETAILS	See Appendix E.
OPERATING EQUIPMENT PLANS & DETAILS	See Appendix E.
MISCELLANEOUS	<ol style="list-style-type: none"> 1. "Application" to construct flood control dam submitted 8 Sept., 1966. 2. "Report Upon the Application of the General State Authority and the Borough of Norristown", dated 15 November 1966. 3. "Permit" issued by DER, Pennsylvania, 13 December 1973. 4. Annual inspection reports through 1973. 5. 18 sheet set of design drawings.

APPENDIX

B

CHECK LIST
VISUAL INSPECTION
PHASE I

Sheet 1 of 11

Name Dam Saw Mill Dam County Montgomery State Pennsylvania National ID # PA 00324
 Type of Dam Earth Hazard Category I-High
 Date(s) Inspection 28 March '79 Weather Clear to Partly Cloudy Temperature Mid 50's

Pool Elevation at Time of Inspection Dry M.S.L. Tailwater at Time of Inspection N/A M.S.L.

Inspection Personnel:

John Boschuk, Jr. (Geotechnical) Vincent McKeever (Hydrologist) John H. Frederick (Geotechnical)
Mary F. Beck (Hydrologist) Raymond Lambert (Geologist) April 17, 1979
Paul F. Marano (Geotechnical)

John Boschuk, Jr. Recorder

Remarks:

Mr. Frederick VanHact, Assistant Engineer for the Borough of Norristown
accompanied the inspection team and provided assistance. Mr. Garr Emanuel, DER,
also accompanied the inspection team.

CONCRETE/MASONRY DAMS

Sheet 2 of 11

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
ANY NOTICEABLE SEEPAGE	N/A	
STRUCTURE TO ABUTMENT/EMBANKMENT JUNCTIONS	N/A	
DRAINS	N/A	
WATER PASSAGES	N/A	
FOUNDATION	N/A	

CONCRETE/MASONRY DAMS

Sheet 3 of 11

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS CONCRETE SURFACES	N/A	
STRUCTURAL CRACKING	N/A	
VERTICAL AND HORIZONTAL ALIGNMENT	N/A	
MONOLITH JOINTS	N/A	
CONSTRUCTION JOINTS	N/A	

EMBANKMENT

Sheet 4 of 11

<u>VISUAL EXAMINATION OF</u>	<u>OBSERVATIONS</u>	<u>REMARKS OR RECOMMENDATIONS</u>
------------------------------	---------------------	-----------------------------------

SURFACE CRACKS

None observed.

UNUSUAL MOVEMENT OR
CRACKING AT OR BEYOND
THE TOE

None observed.

SLOUGHING OR EROSION OF
EMBANKMENT AND ABUTMENT
SLOPES

No significant sloughing or erosion observed.

VERTICAL AND HORIZONTAL
ALIGNMENT OF THE CREST

Horizontal alignment is good. Vertical alignment was checked and crest undulations were minor being less than 4 or 5 inches.

RIPRAP FAILURES

No failures but minor distortions and slope adjustments were observed.

EMBANKMENT

Sheet 5 of 11

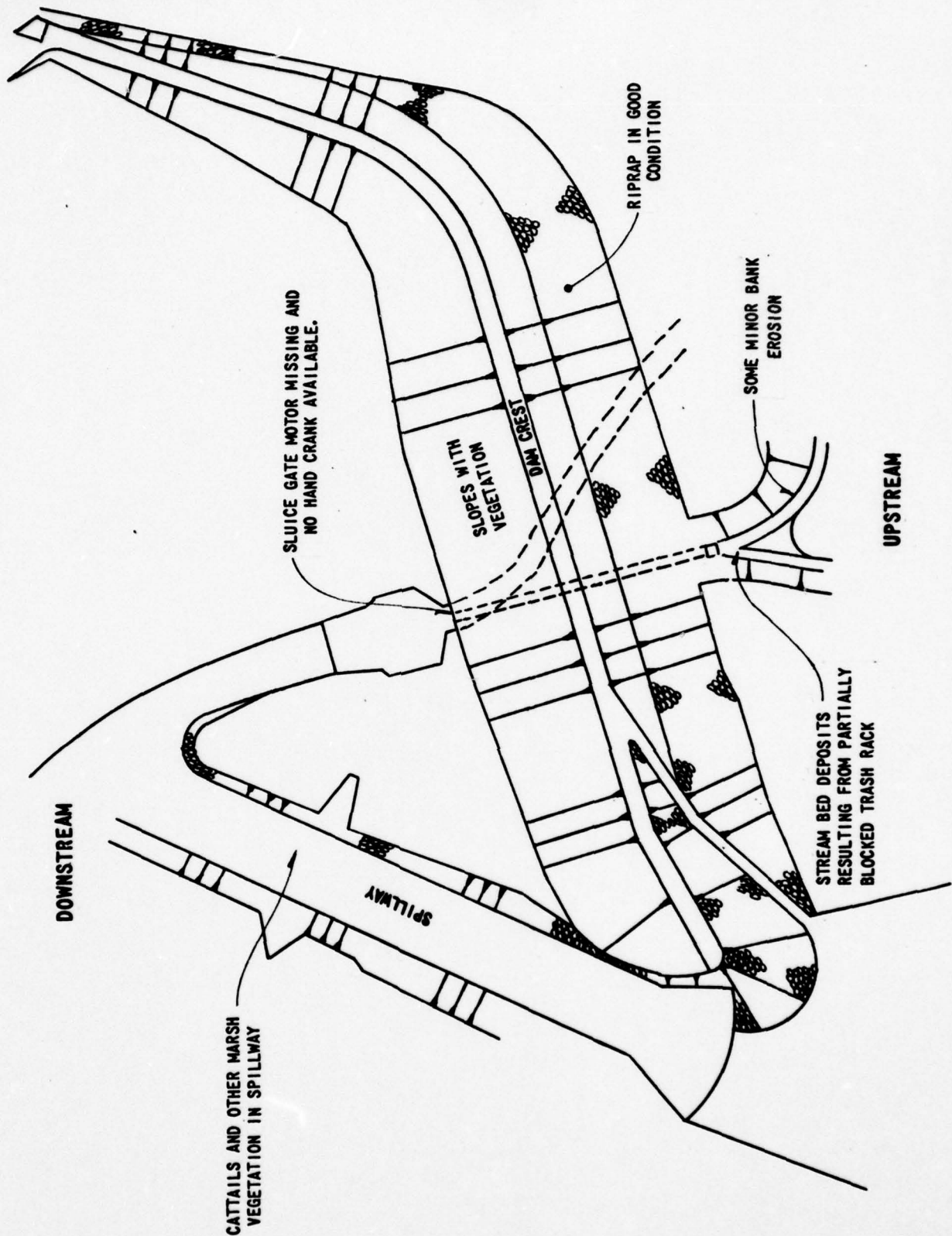
VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
-----------------------	--------------	----------------------------

JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	All junctions are in good condition.	
---	--------------------------------------	--

ANY NOTICEABLE SEEPAGE	None observed. The reservoir is normally dry impounding water only during severe storms for a short period of time.	
------------------------	---	--

STAFF GAGE AND RECORDER	Staff gages from elevations 135 to 155 are embedded in concrete on the right side of the embankment parallel to the upstream toe and the school property line.	
-------------------------	--	--

DRAINS	The drains appear to be dry and there was no exterior evidence to indicate that they would not function properly. It is noted that the reservoir was dry during the inspection and the drains were expected to be dry.	
--------	--	--



FIELD OBSERVATION PLAN
SAW MILL DAM

SHEET 5A OF 11

OUTLET WORKS

Sheet 6 of 11

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	The conduit could not be inspected as it is buried in the embankment and water was flowing through the system restricting reasonable access.	
INTAKE STRUCTURE	The structure appears to be in good condition with no spalling or cracking of concrete observed. The trash racks were partially clogged and it is reported that maintenance crews must clean these racks several times a year. Silt and miscellaneous debris are also deposited in the approach channel.	
OUTLET STRUCTURE	The structure is in good condition with the exception of the sluice gate. The Borough Manager reports that the gasoline powered motor for the sluice gate was recently stolen. An inspection revealed that there was no motor or hand crank in the building which could be used to operate the gate. The sluice was not well lubricated and needs maintenance.	
OUTLET CHANNEL	The plunge pool and outlet channel appear stable and in good condition.	
		78" Sluice Gate (Limitorque; Serial No. 78892A) Motor was recently stolen and hand crank was not available. Valve needs general maintenance such as lubrication and cleaning.

UNGATED SPILLWAY

Sheet 7 of 11

<u>VISUAL EXAMINATION OF</u>	<u>OBSERVATIONS</u>	<u>REMARKS OR RECOMMENDATIONS</u>
CONCRETE WEIR	The ogee weir is in good condition with only minor surficial concrete spalling on the crest. See Photograph No. 12.	
APPROACH CHANNEL	Good condition.	
DISCHARGE CHANNEL	The concrete discharge chute and stilling basin are in good condition. Thereafter, the channel is marshy with standing water and cattails. During significant flows this would have very little effect on discharge capacity.	
BRIDGE AND PIERS	None.	
RETAINING WALLS	Observed to be in good condition with only minor cracking noted on the left wall upstream of the ogee weir. See Photograph No. 11.	

GATED SPILLWAY

Sheet 8 of 11

<u>VISUAL EXAMINATION OF</u>	<u>OBSERVATIONS</u>	<u>REMARKS OR RECOMMENDATIONS</u>
CONCRETE SILL	N/A	
APPROACH CHANNEL	N/A	
DISCHARGE CHANNEL	N/A	
BRIDGE AND PIERS	N/A	
GATES AND OPERATION EQUIPMENT	N/A	

INSTRUMENTATION

Sheet 9 of 11

<u>VISUAL EXAMINATION</u>	<u>OBSERVATIONS</u>	<u>REMARKS OR RECOMMENDATIONS</u>
---------------------------	---------------------	-----------------------------------

MONUMENTATION/SURVEYS		
-----------------------	--	--

None.

OBSERVATION WELLS		
-------------------	--	--

None.

WEIRS		
-------	--	--

None.

PIEZOMETERS		
-------------	--	--

None.

OTHER		
-------	--	--

None.

RESERVOIR

Sheet 10 of 11

<u>VISUAL EXAMINATION OF</u>	<u>OBSERVATIONS</u>	<u>REMARKS OR RECOMMENDATIONS</u>
------------------------------	---------------------	-----------------------------------

SLOPES

Moderate, vegetated and stable.

SEDIMENTATION

Minimal, no effect on flood water storage. The stream flows through the reservoir and some undercutting of stream banks and deposition is occurring.

DOWNSTREAM CHANNEL

Sheet 11 of 11

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
-----------------------	--------------	----------------------------

CONDITION
(OBSTRUCTIONS,
DEBRIS, ETC.)

The natural channel below the Formance Street bridge is rocky with 4 foot left bank and about a 13 foot right bank. The banks are covered with trees and brush. About 0.6 mile below the dam, the channel enters a 12 x 9 foot culvert. There are five bridges between the dam and the culvert.

SLOPES

The valley gradient is about 0.01.

APPROXIMATE NO.
OF HOMES AND
POPULATION

Dam is located in an urban area. Immediately downstream of the dam, houses are built adjacent to the stream.

APPENDIX

C

SAW MILL DAM
CHECK LIST
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATADRAINAGE AREA CHARACTERISTICS: Urban, 75% residential development.ELEVATION TOP NORMAL POOL (STORAGE CAPACITY): Dry.ELEVATION TOP FLOOD CONTROL POOL (STORAGE CAPACITY): 153 feet.ELEVATION MAXIMUM DESIGN POOL: ---ELEVATION TOP DAM: 153 feet.

EMERGENCY SPILLWAY

- a. Elevation 142.0 feet.
- b. Type Concrete ogee weir.
- c. Width 123[±] feet along crest of weir.
- d. Length 222 feet.
- e. Location Spillover Left abutment.
- f. Number and Type of Gates None.

PRINCIPAL SPILLWAY

- a. Type 78 inch concrete pipe.
- b. Location Station 6+60.
- c. Entrance inverts 106.5 feet.
- d. Exit inverts 108.11 feet (end sill of outlet structure).
- e. Emergency draindown facilities Through principal spillway.

HYDROMETEOROLOGICAL GAGES:

- a. Type None.
- b. Location Not Available.
- c. Records Not available.

MAXIMUM NON-DAMAGING DISCHARGE: _____

HEC-1, REVISED
FLOOD HYDROGRAPH PACKAGE

The original "Flood Hydrograph Package" (HEC-1), developed by the Hydrologic Engineering Center, Corps of Engineers, has been modified for use under the National Dam Inspection Program. The "Flood Hydrograph Package (HEC-1), Dam Safety Version", hereinafter referred to as, HEC-1, Rev., has been modified to require less detailed input and to include a dam breach analysis. The required input is obtained from the field inspection of a dam, any available design/evaluation data, relatively simple hydraulic calculations, or information from the USGS Quandrangle maps. The input format is flexible in order to reflect any unique characteristics of an individual dam.

HEC-1, Rev. computes a reservoir inflow hydrograph based on individual watershed characteristics such as: area, percentage of impervious surface area, watershed shape, and hydrograph characteristics determined from regional correlation studies by the Corps of Engineers, Baltimore District. The inflow is routed through the reservoir using spillway discharge data obtained from the field inspection or design data. Flood storage capacity is determined from USGS maps or design information and verified by the field inspection. In the event a spillway cannot discharge 0.5 PMF without overtopping and failure of the dam, downstream channel characteristics obtained from the field inspection and USGS maps are inputted and flows are routed downstream to the damage center and a dam breach analysis is performed.

Included in this Appendix are the HEC-1, Rev. pertinent input values and a summary print-out tables.

BY MFB DATE 3/17/79 SUBJECT Saw Mill Dam SHEET 3 OF 7
CHKD. BY DATE Hydrology / Hydraulics JOB No.

Classification (Ref. Recommended Guidelines for Safety Inspection of Dams)

1. The hazard classification is "High" as failure would result in loss of life.
2. The size classification is "Intermediate" based on its 47 foot height
3. The spillway design flood, based on size and hazard classification, is the Probable Maximum Flood (PMF).

Hydrology and Hydraulic Analysis

1. Readily available design data was limited to statements in the "Application Report" and two letters in DER files.
 - a. Drainage area - 3.92 sq. miles
 - b. Spillway design discharge (no freeboard)
18,000 cfs (maximum probable storm, weather bureau)
 - c. Conduit capacity w/ reservoir at emergency spillway crest - 1135 cfs
 - d. Storage
430 Ac-Ft (April 23, 1965 letter)
39.3 Ac-Ft flood water (Application Report)
2. Evaluation of structure was by use of the computer program. Computer input data as follows:

Inflow Hydrograph

Drainage area, measured 3.68 sq. miles from USGS maps; conservatively, use design value.

Rainfall, shown on sheet 6, ref. Hydrometeorological Report No. 33.

Snyder's parameters, t_p & C_p

$$t_p = C_t (L \cdot L_{ea})^{0.3}$$

$$\begin{aligned} C_t &= 1.35 \\ C_p &= 0.65 \\ L &= 3.36 \text{ miles} \\ L_{ea} &= 1.94 \text{ miles} \\ t_p &= 2.37 \end{aligned} \quad \left. \begin{array}{l} \text{Information received from Corps of} \\ \text{Engineers, Baltimore, for Zone 7.} \\ \text{From USGS} \\ \text{maps} \end{array} \right\}$$

BY MFB DATE 5/12/79

SUBJECT _____

SHEET 4 OF 7

CHKD. BY _____ DATE _____

Saw Mill Dam

JOB No. _____

Hydrology / HydraulicsReservoir Routingelevation - dischargeto determine design head, H_o (Ref. USBR Design of Small Dams)

	<u>from Ref.</u>	<u>from dwg.</u>	<u>H_o</u>
$R_1 = 0.235 H_o$		$= 2' 8 \frac{3}{4}"$	11.66
$0.204 H_o$		$= 3' 5 \frac{3}{4}"$	11.66
$R_2 = 0.530 H_o$		$= 6' 2 \frac{1}{4}"$	11.64
$0.147 H_o$		$= 1' 8 \frac{9}{16}"$	11.65'
$R_5 = 2.000 H_o$		$= 32' 7 \frac{1}{16}"$	11.65'

weir length

u/s face $L = 126 \text{ ft}$ $R = 150 \text{ ft}$ } from dwg.
ogee crest $R = 146.685 \text{ ft}$ }
 $L = 123.2 \text{ ft}$ field checked

height of u/s face, P , is about 6 ft (field checked) C_o at H_o is 3.8 C at $H = 11 \text{ ft}$ is $0.99 \cdot 3.8 = 3.76$

$$Q = C L H^{3/2}$$

$$= 3.76 \cdot 123.2 \cdot 11^{3/2}$$

$$= 16,900 \text{ cfs (neglecting any abutment contraction)}$$

The computed PMF peak inflow is 9993 cfs. As the
spillway capacity is greater, no flood routing is
required and the spillway is rated as "Adequate."

Estimated maximum reservoir level,

$$9993 = 123.2 \cdot C \cdot H^{3/2}$$

$$\text{if } H = 8'$$

$$C = 0.955 \cdot 3.8$$

$$Q = 10,116 \text{ cfs}$$

therefore, maximum reservoir level - 150 ft.

MFB

5/17/79

Saw Mill Dam
Hydrology / Hydraulics

34. 5 OF 7

1*****
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 26 FEB 79

RUN DATE* 79/05/17.
TIME* 12.12.15.

SAW MILL DAM
NAT ID NO. PA 00324 DER NO. 46-261
OVERTOPPING ANALYSIS

NO	NHE	NMIN	IDAY	JOB SPECIFICATION				IPLT	IPRT	NSTAN
				IHR	IMIN	METRC	LROPT			
150	0	15	0	0	0	0	0	0	-4	0
			JOPER	NUT	LROPT	TRACE				
			5	0	0	0				

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 3 LRTIO= 1
RTIOS= .50 .80 1.00

MFB

5/17/79

Saw Mill Dam
Hydrology / Hydraulics

SH 6 of 7

SUB-AREA RUNOFF COMPUTATION

INFLOW HYDROGRAPH

ISTAQ	ICONP	IECON	ITAPE	JPLT	JPAT	INAME	ISTAGE	IAUTO
IN	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	3.92	0.00	3.92	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	23.50	113.00	123.00	132.00	143.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LROPT	STAKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.05	0.00	0.00

UNIT HYDROGRAPH DATA

TP= 2.37 CP= .65 NTA= 0

RECESSION DATA

STRTO= -1.50 QRCSN= -.05 RTIOR= 2.00

UNIT HYDROGRAPH 49 END-OF-PERIOD ORDINATES, LAG= 2.37 HOURS, CP= .65 VOL= 1.00									
23.	86.	173.	273.	380.	489.	584.	653.	694.	707.
684.	623.	551.	487.	430.	380.	336.	297.	263.	232.
205.	181.	160.	142.	125.	111.	98.	86.	76.	67.
60.	53.	47.	41.	36.	32.	28.	25.	22.	20.
17.	15.	14.	12.	11.	9.	8.	7.	6.	

END-OF-PERIOD FLOW						
MO.DA	HR.MM	PERIOD	RAIN	EXCS	LOSS	COMP Q
0						

SUM 26.88 24.47 2.42 237028.
(683.)(621.)(61.)(6711.89)

MFB

5/17/79

Saw Mill Dam
Hydrology / Hydraulics

SH. 7 OF 7

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
 FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
 AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS		
				RATIO 1	RATIO 2	RATIO 3
				.50	.80	1.00
HYDROGRAPH AT	IN	3.92	1	4997.	7994.	9993.
	(10.15)	(141.49)	226.38)	282.97)

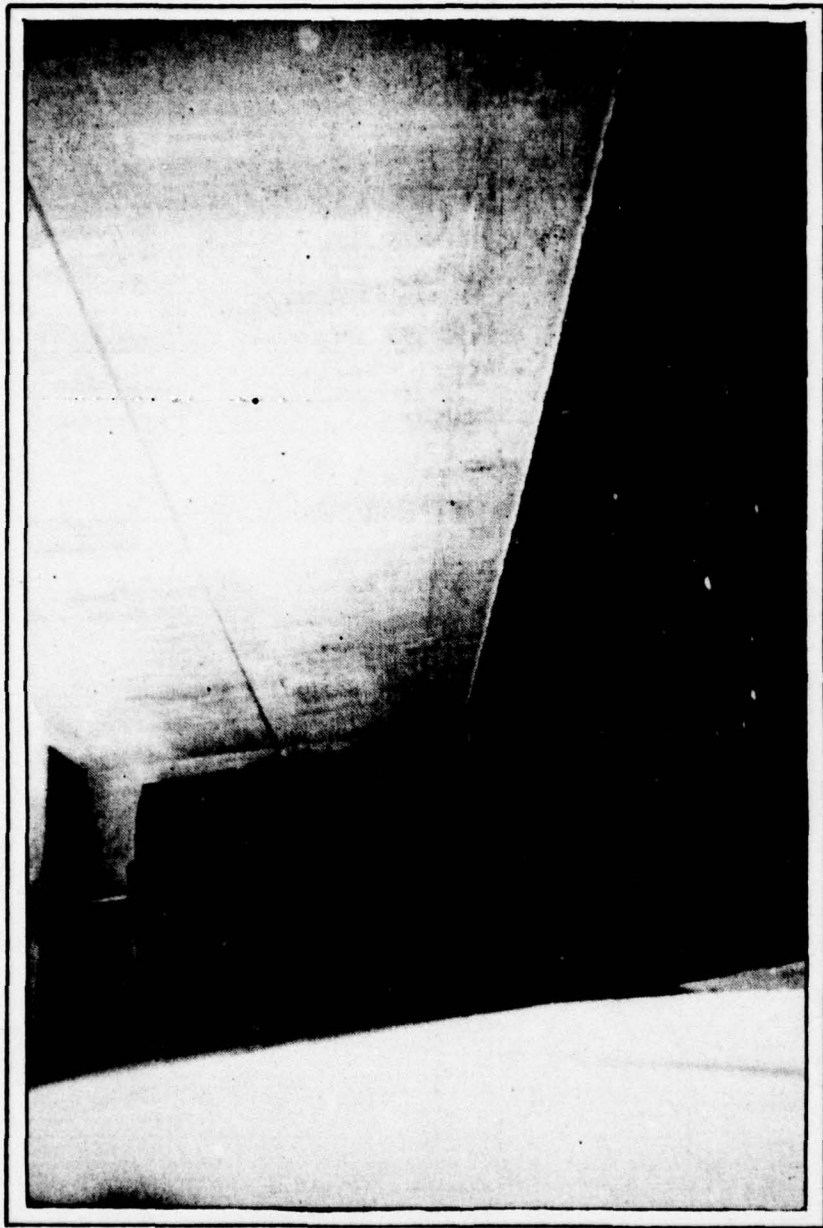
APPENDIX

D



VIEW OF GATED PRINCIPAL INTAKE
STRUCTURE SHOWING TRASH RACK.
NOTE TRASH ACCUMULATIONS.

PHOTOGRAPH NO. 1



VIEW OF PRINCIPAL SPILLWAY OUTLET
STRUCTURE AND GATE LOOKING UPSTREAM
FROM END OF WING WALL.

PHOTOGRAPH NO. 2



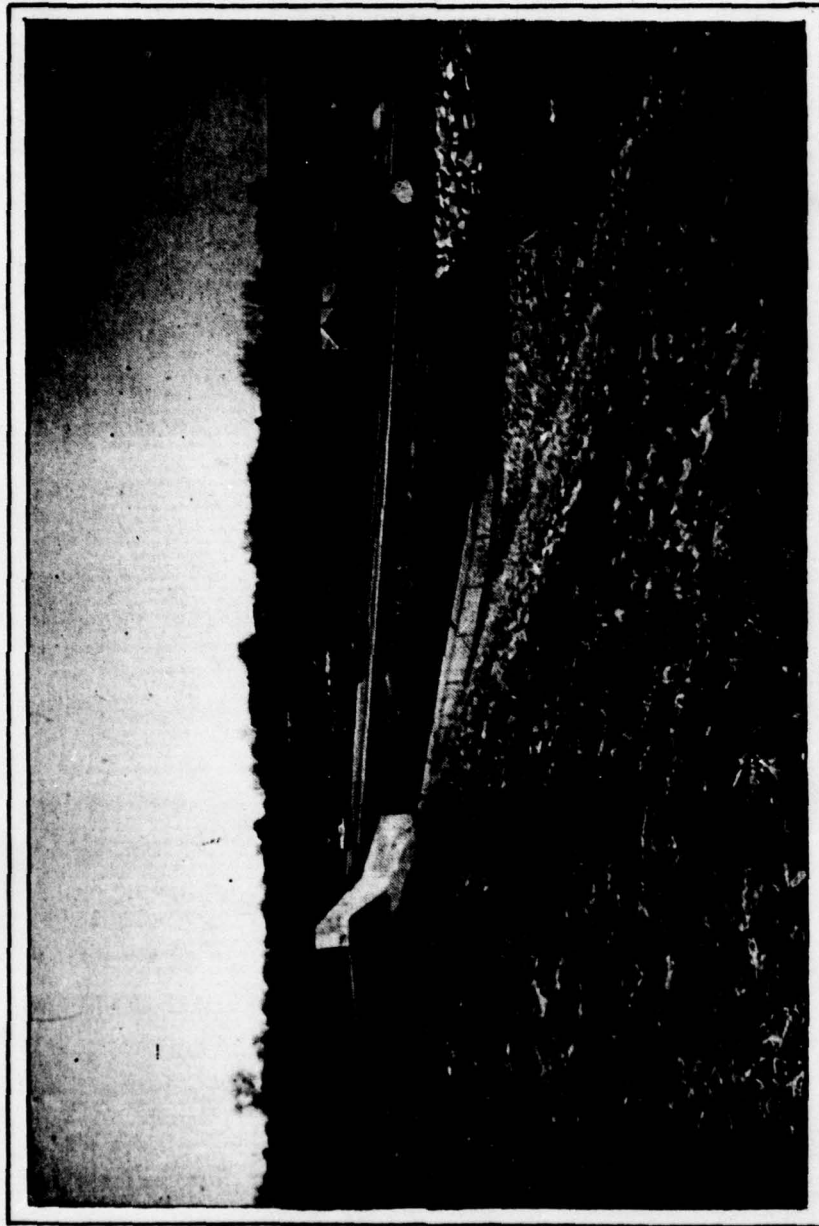
DISCHARGE CHANNEL DOWNSTREAM OF
OUTLET STRUCTURE.

PHOTOGRAPH NO. 3



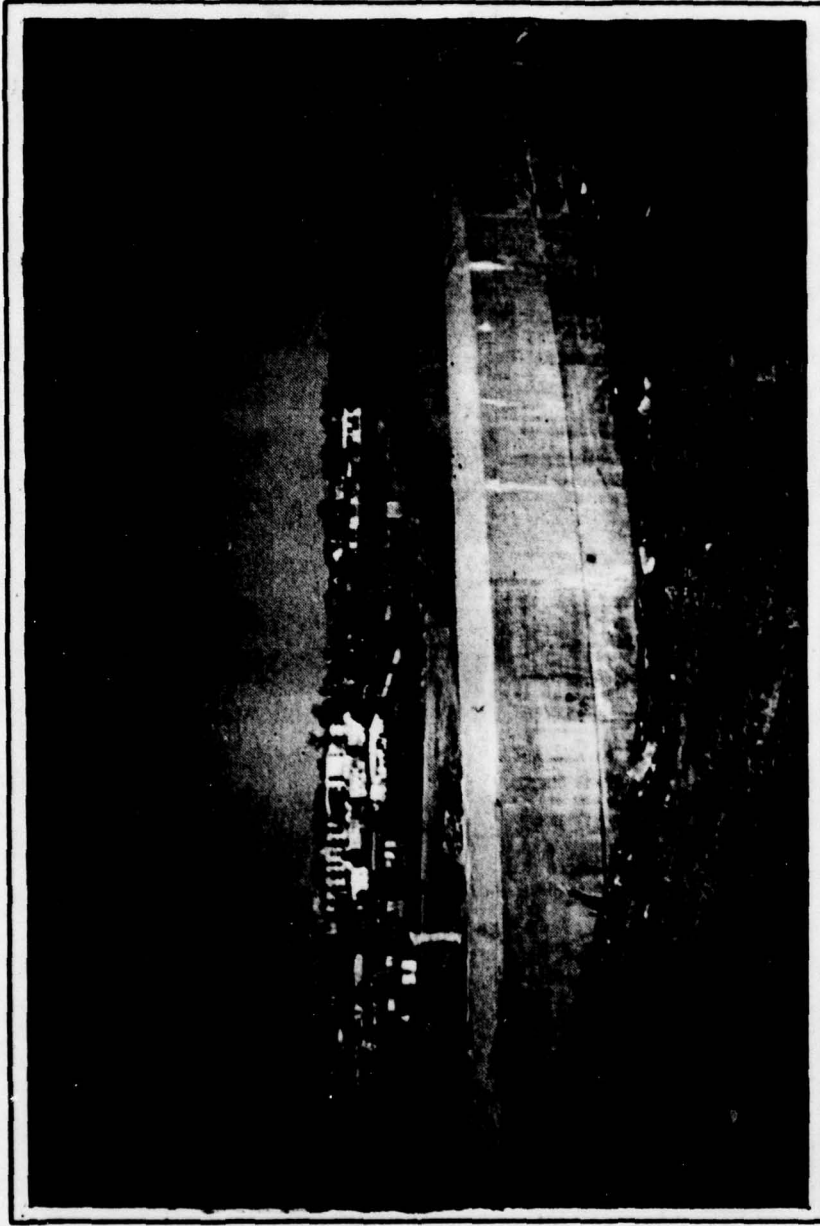
VIEW OF UPSTREAM SLOPE AND
RESERVOIR AREA.

PHOTOGRAPH NO. 4



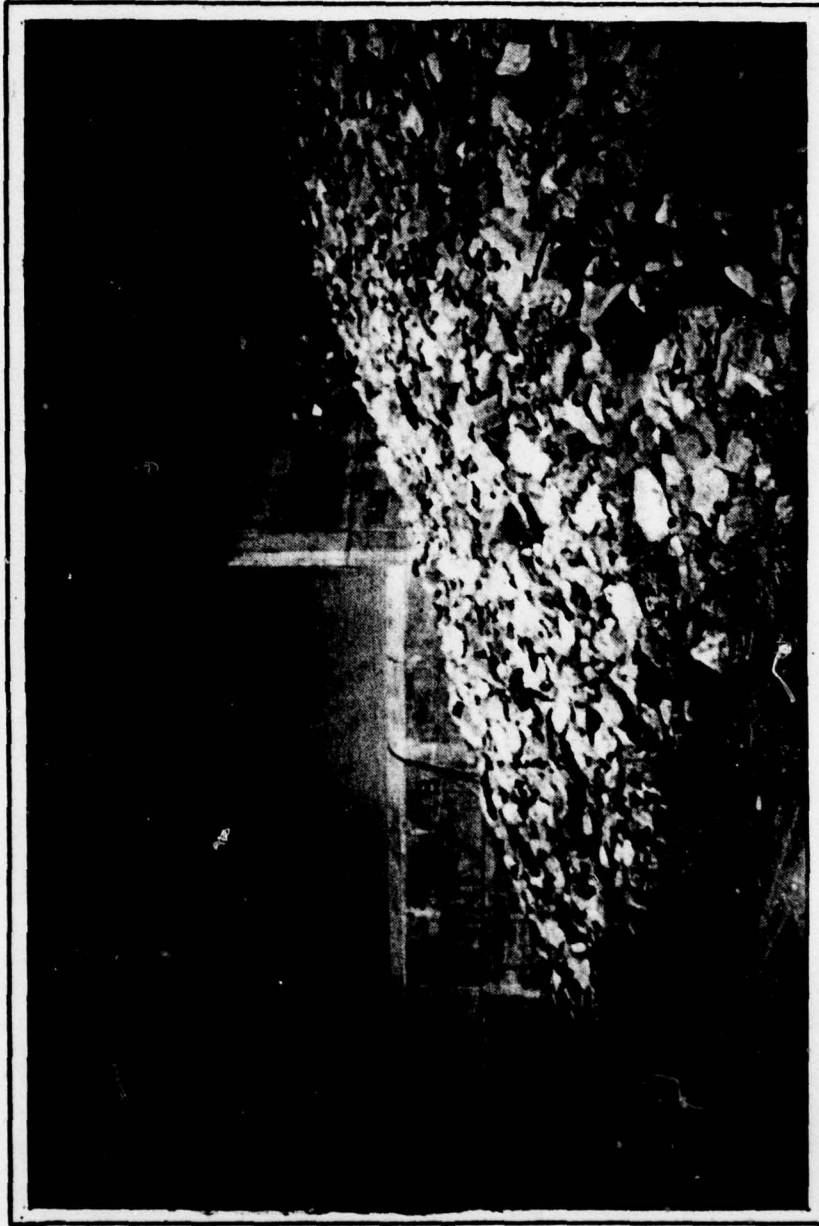
VIEW OF DOWNSTREAM SLOPE AND
EMERGENCY SPILLWAY.

PHOTOGRAPH NO. 5



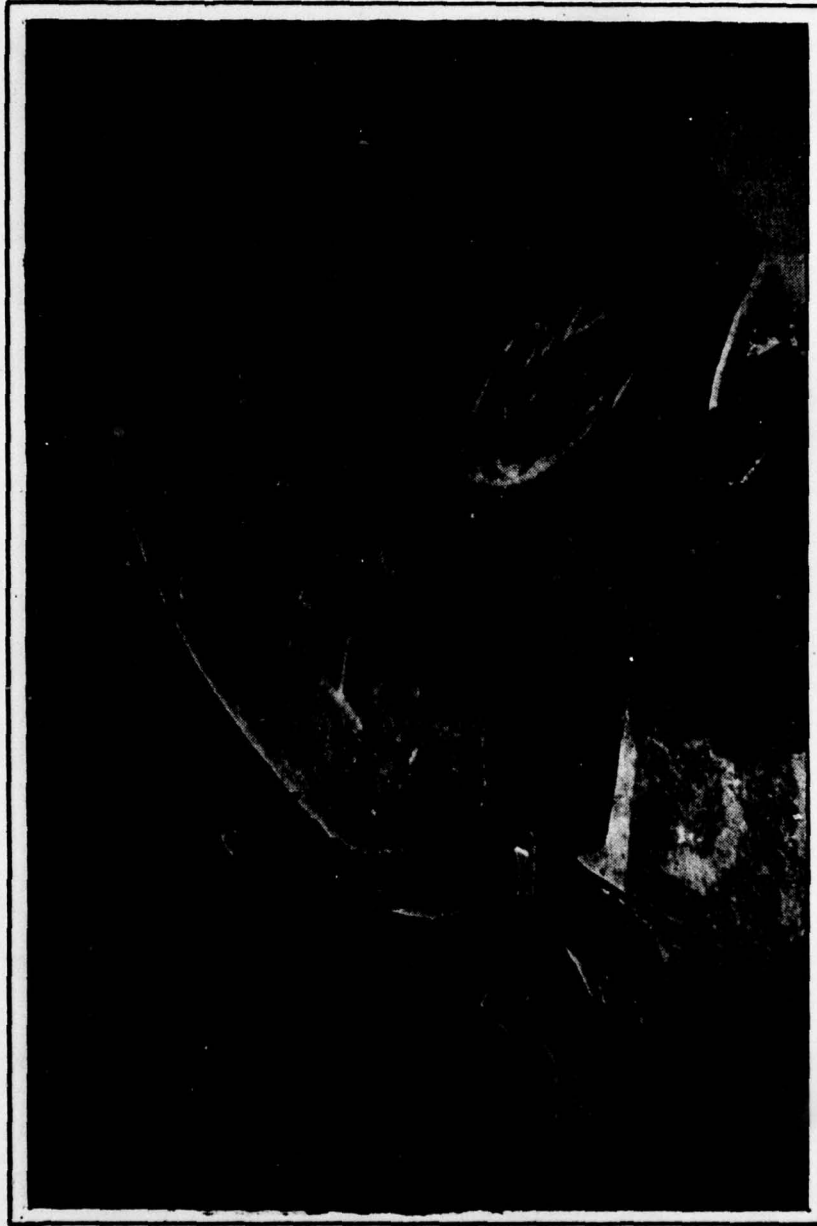
RESERVOIR SIDE OF EMERGENCY SPILLWAY
WEIR.

PHOTOGRAPH NO. 6



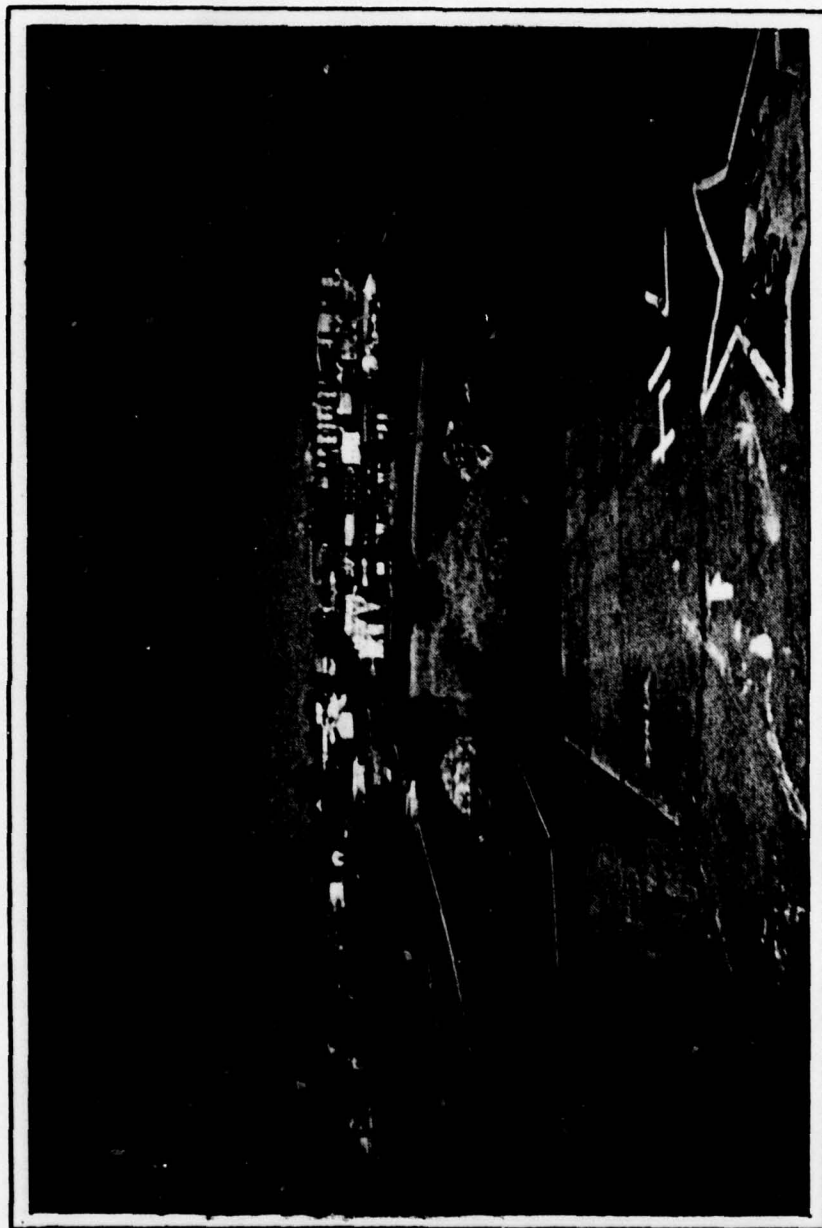
ALTERNATE VIEW OF RESERVOIR SIDE
OF EMERGENCY SPILLWAY AT JUNCTION
BETWEEN DAM AND RIGHT WALL OF
SPILLWAY.

PHOTOGRAPH NO. 7



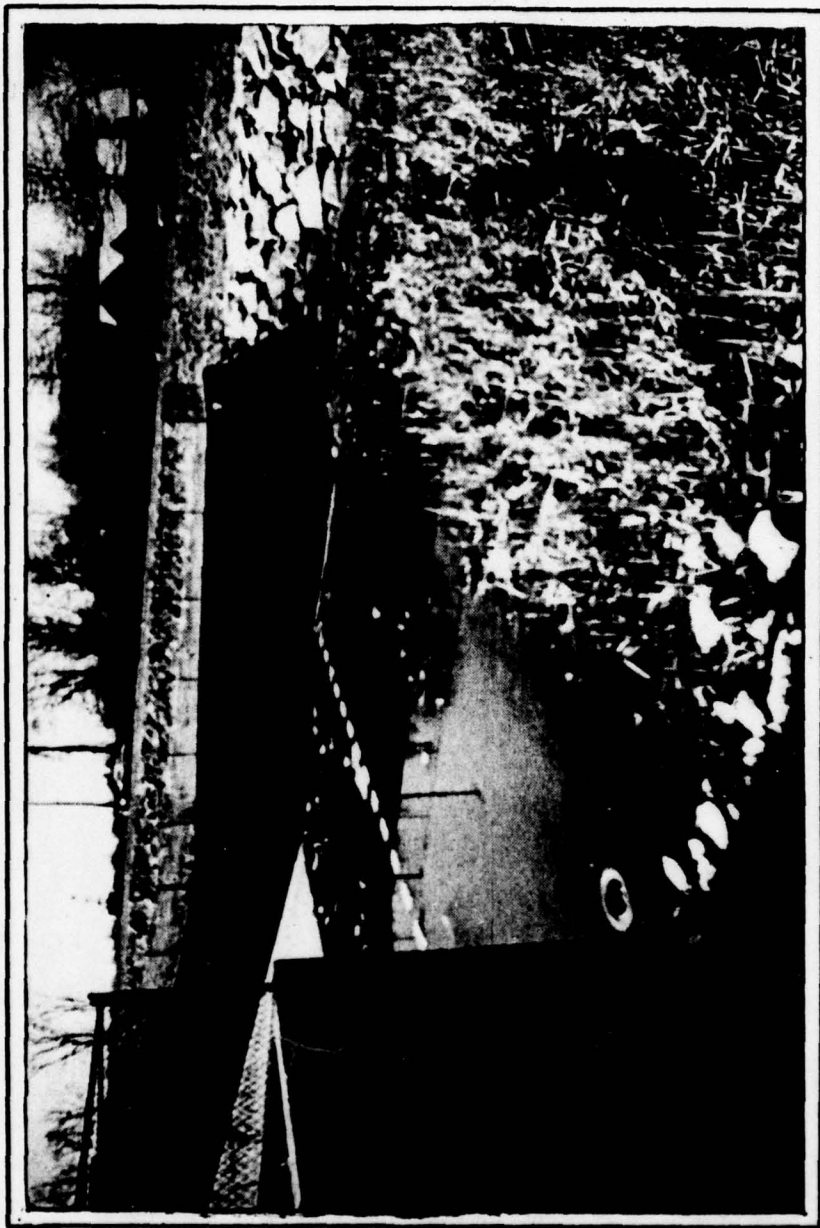
OVERVIEW OF EMERGENCY SPILLWAY
CREST.

PHOTOGRAPH NO. 8



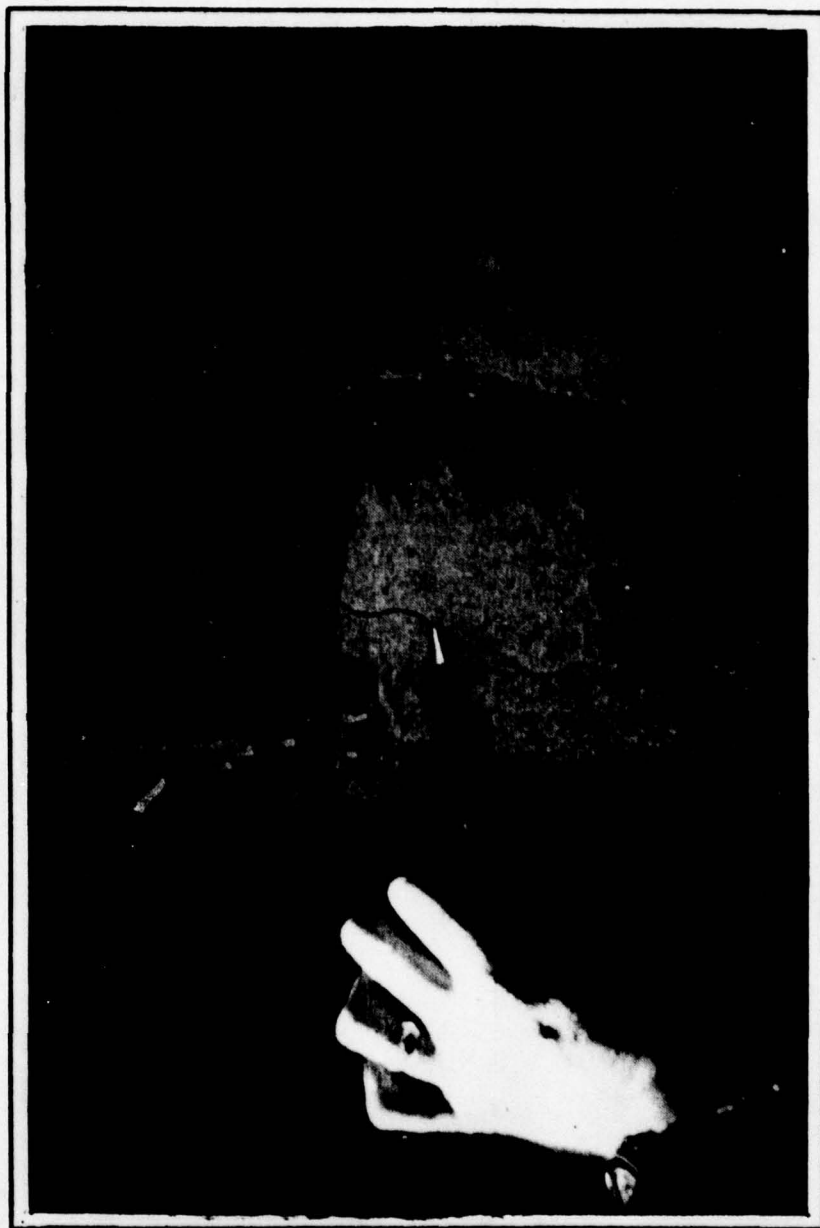
OVERVIEW OF EMERGENCY SPILLWAY
DISCHARGE CHANNEL.

PHOTOGRAPH NO. 9



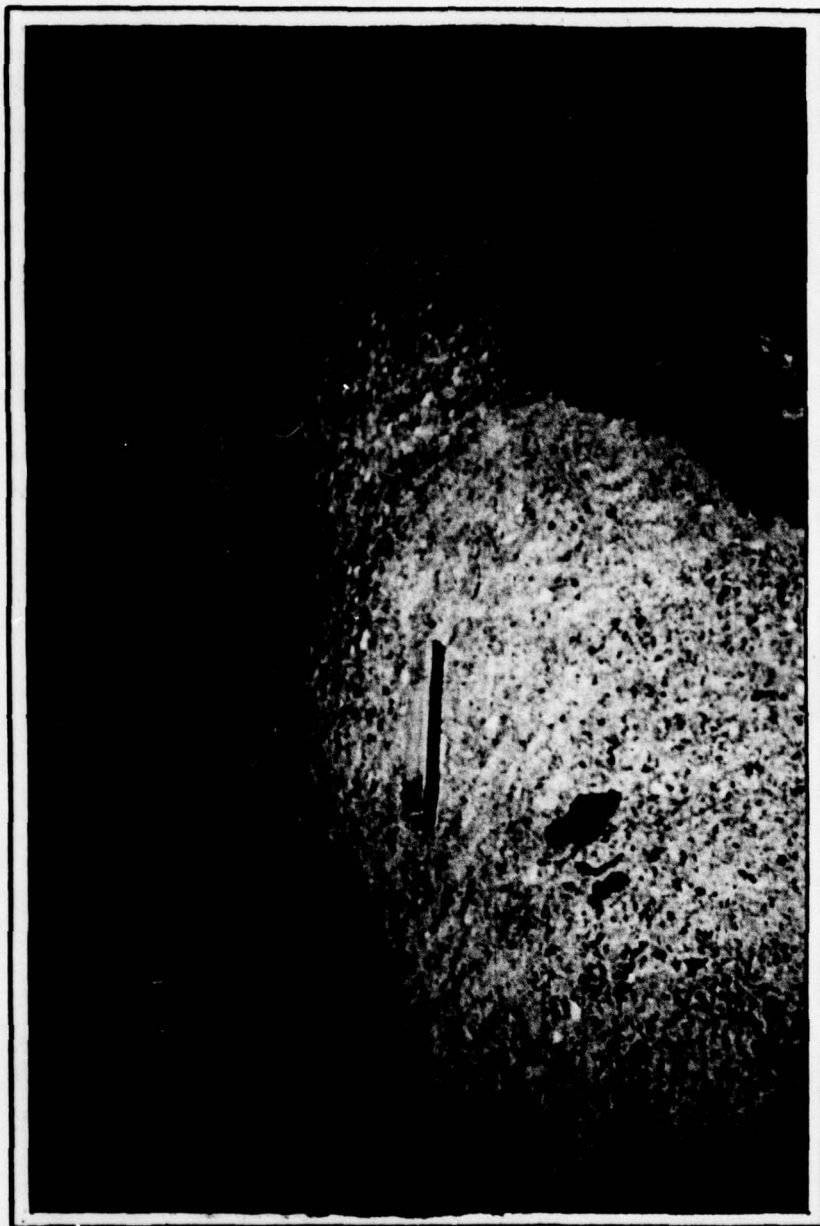
END OF EMERGENCY SPILLWAY DISCHARGE
CHANNEL.

PHOTOGRAPH NO. 10



TYPICAL EXAMPLE OF CRACKS IN EMERGENCY
SPILLWAY WING WALLS.

PHOTOGRAPH NO. 11



SURFICIAL SPALLING NOTED ON CREST
OF EMERGENCY SPILLWAY WEIR.

PHOTOGRAPH NO. 12



SECOND BRIDGE DOWNSTREAM OF DAM.

PHOTOGRAPH NO. 13

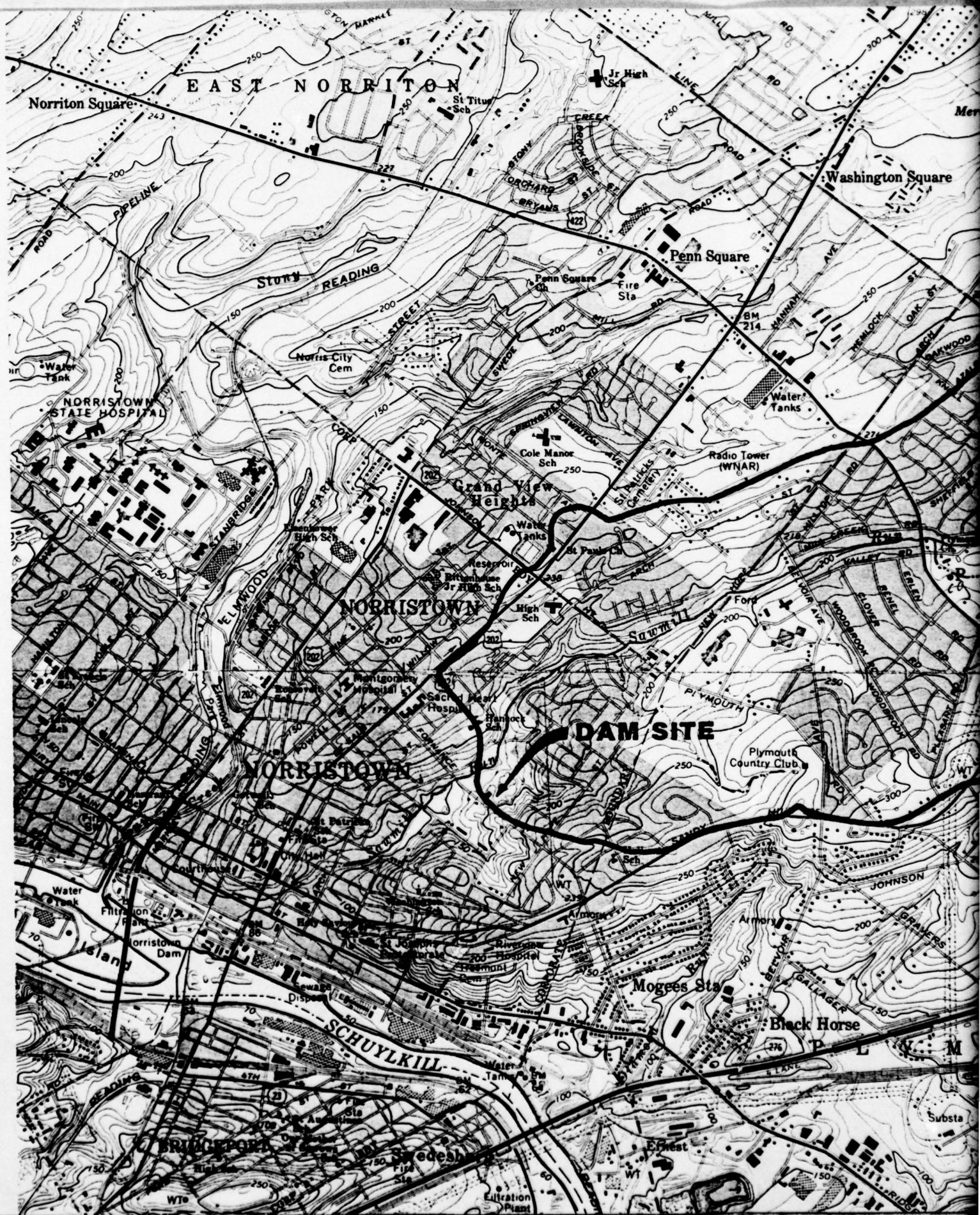


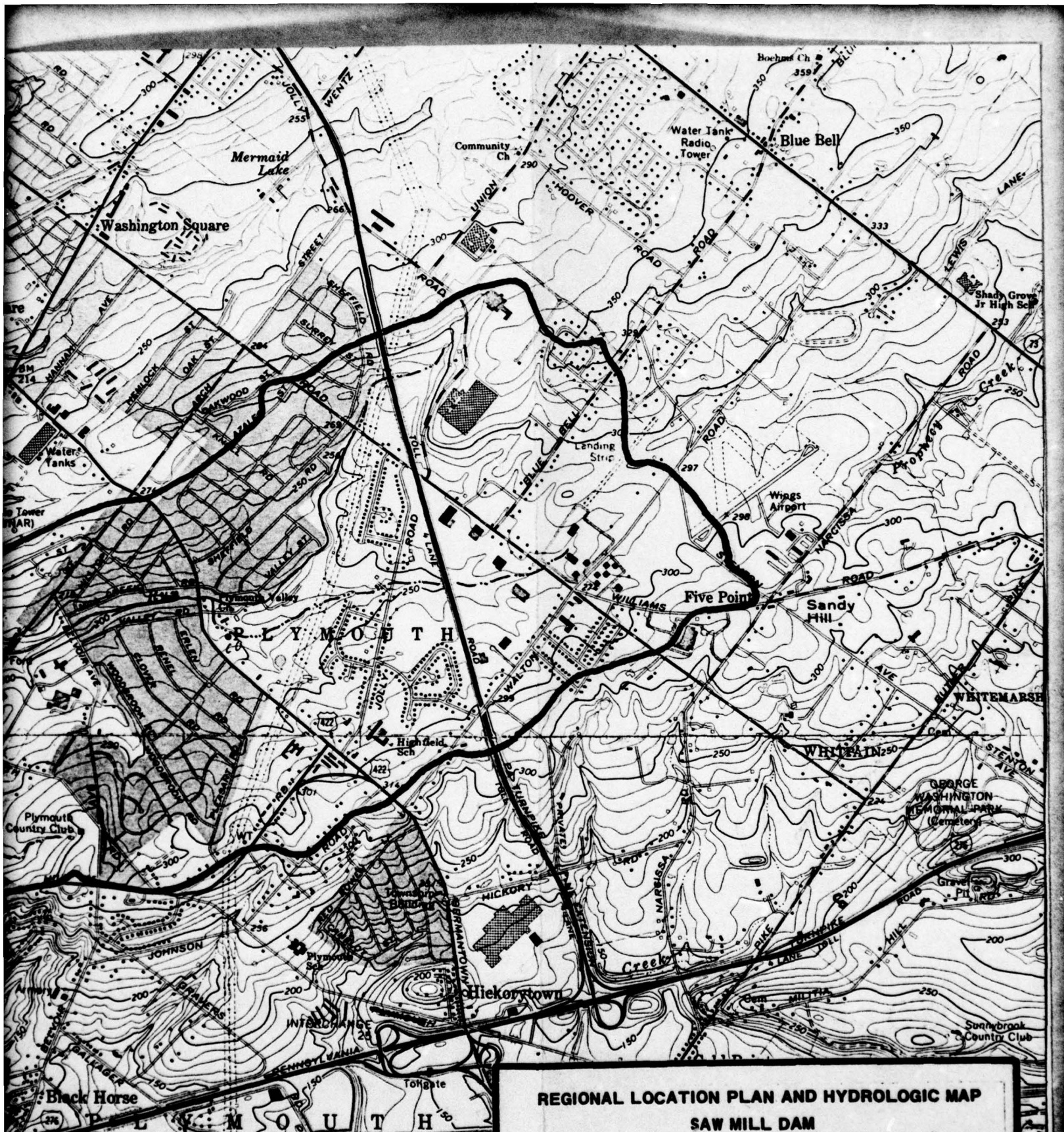
VIEW OF CULVERT LEADING TO THE
TUNNEL BENEATH THE MUNICIPAL
BUILDING.

PHOTOGRAPH NO. 14

APPENDIX

E





CH. 101.000



Note: By 120 ft. to 125 ft. concrete

Ground surface

125 ft. concrete

STAFF GAUGE 3
Scale 1:1

STAFF GAUGE DATA

GAUGE NO.	ELEVATION (ft.)
SG-1	120.00
SG-2	125.00
SG-3	130.00
SG-4	135.00
SG-5	140.00
SG-6	145.00

Water level
under bridge

FORNANCE STREET

ET STA 101.82%

14' Fill

PC Sta 7-68.24%

14' Fill

Derrick alone

5-205

5-005

6-005

7-00

10' 2

10' 2

5' Surfacing

250' Ditch

1112

1112

1112

1112

1112

1112

1112

1112

1112

CURVE NO. 20

PI NO 20 N 5014 99
E 5003 33
Δ = 39° 00' 00"
D = 15° 00' 00"
R = 381.27'
T = 135.27'
L = 260.00'

End of existing pavement

ROT No. 3
N 5740.61
E 3240.95
Sta 14+60.00

CURVE NO. 1

PI NO 2 N 5469 84
E 3350 75
Δ = 55° 31' 17"
D = 30° 50'
R = 190.99'
T = 100.53'
L = 105.07'

Remove existing
concrete structures

12" Rebar

34x7x24

4 Concrete slab

6" Surfacing

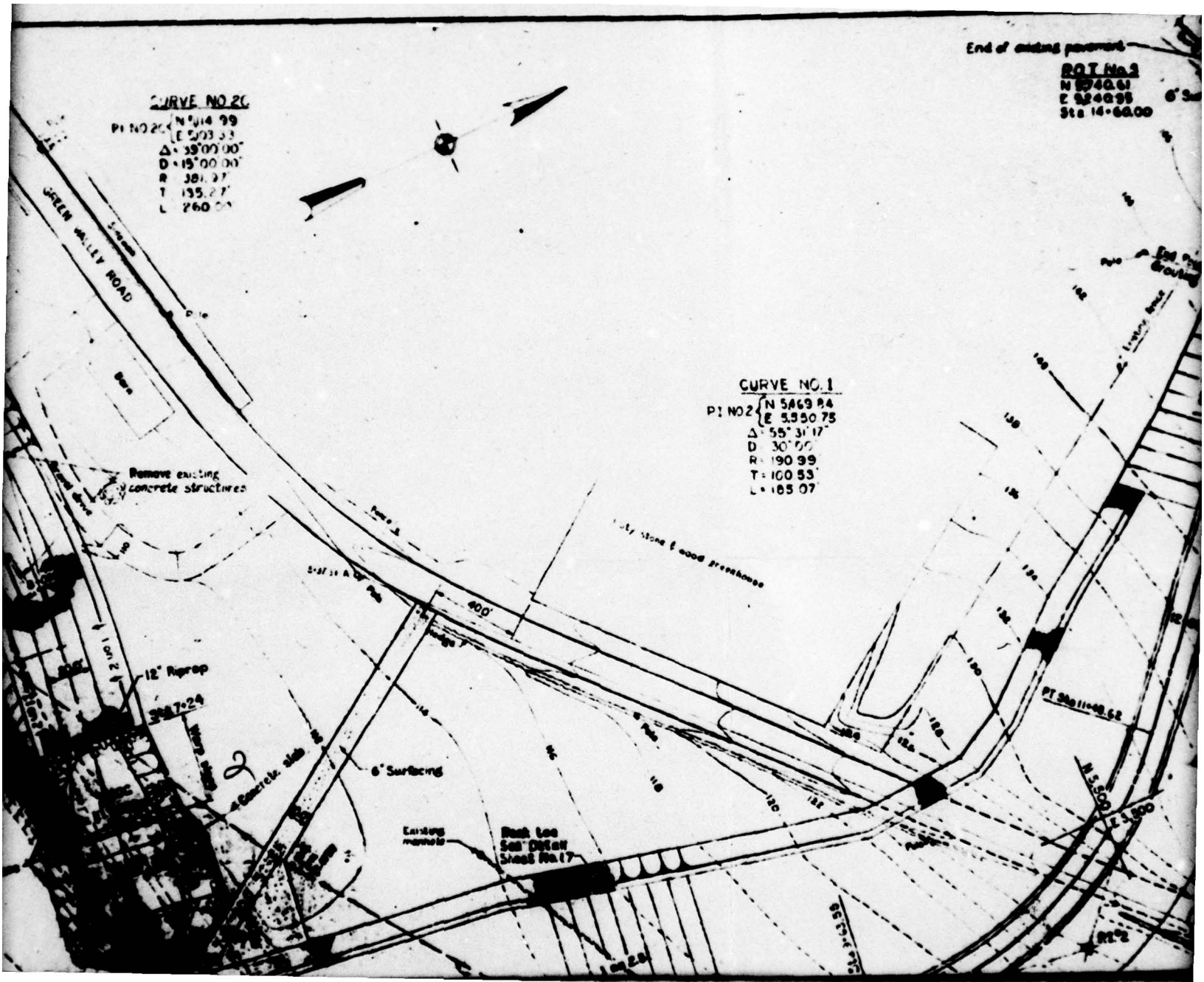
Existing manhole

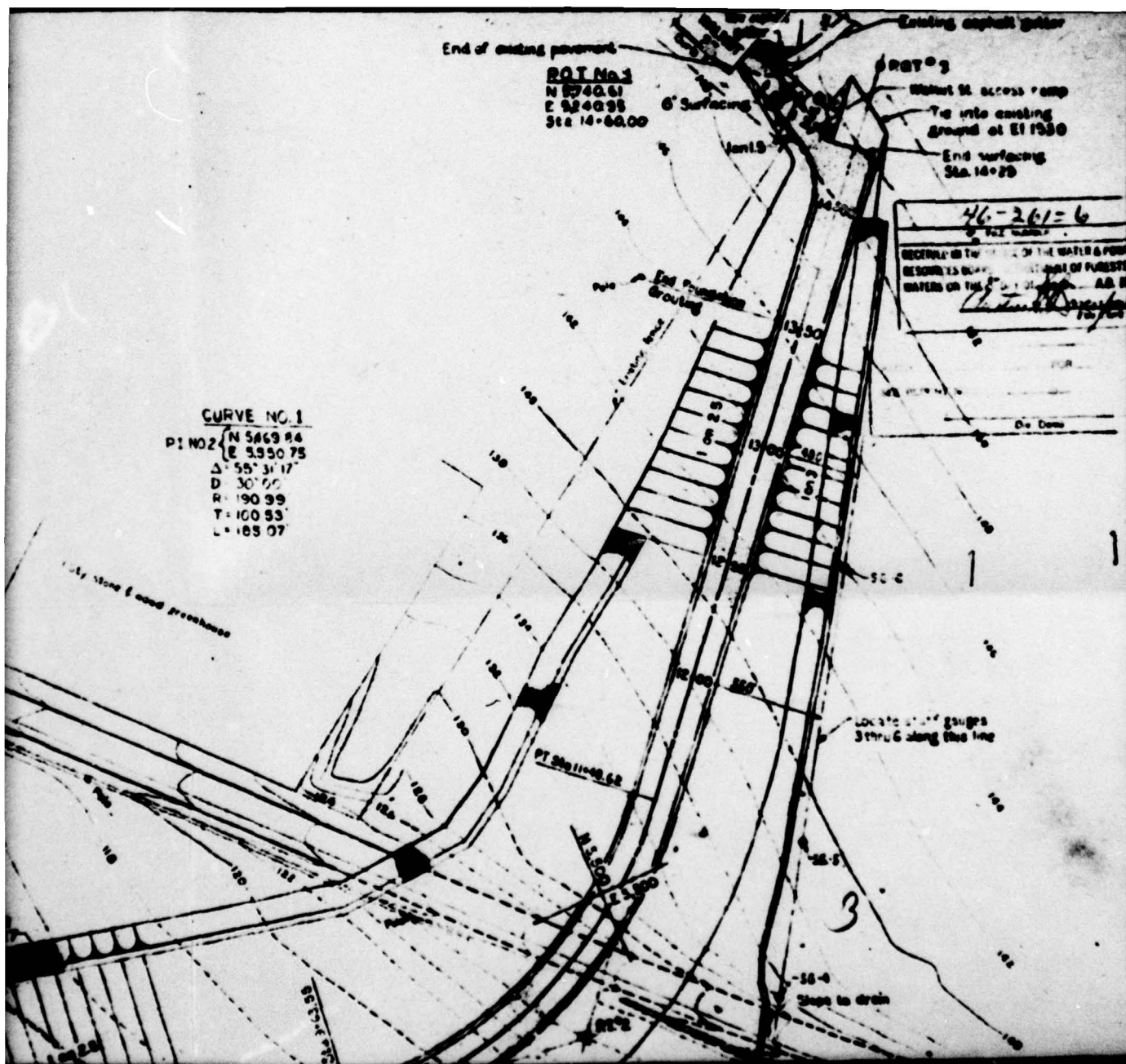
Push too
San Dora
Sines No. 17

City stone & wood greenhouse

PT 34+11+00.62

N 5500
E 3300





POT NO 2
N 43° 31' 15"
E 5356.37
Sta 3+50.225

Construct ditch along
see as directed by The
Authority

When the
excavation
limit is

Begin ditch
line El 110

Begin fence
POT NO 1
N 43° 31' 15"
E 5356.37
Sta 3+50.225

Sta 0+00.00

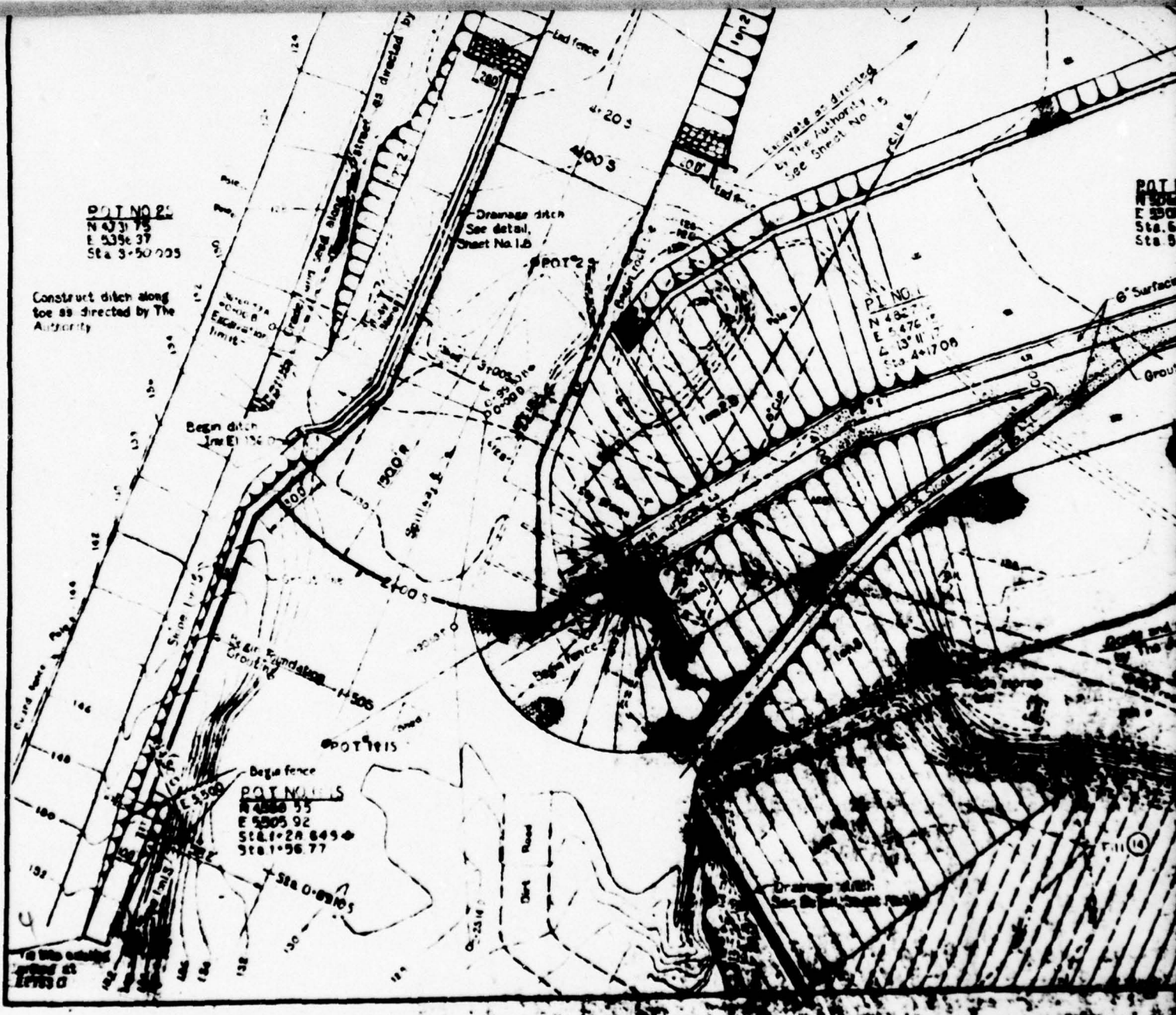
Drainage ditch
See detail,
Sheet No. 1.B

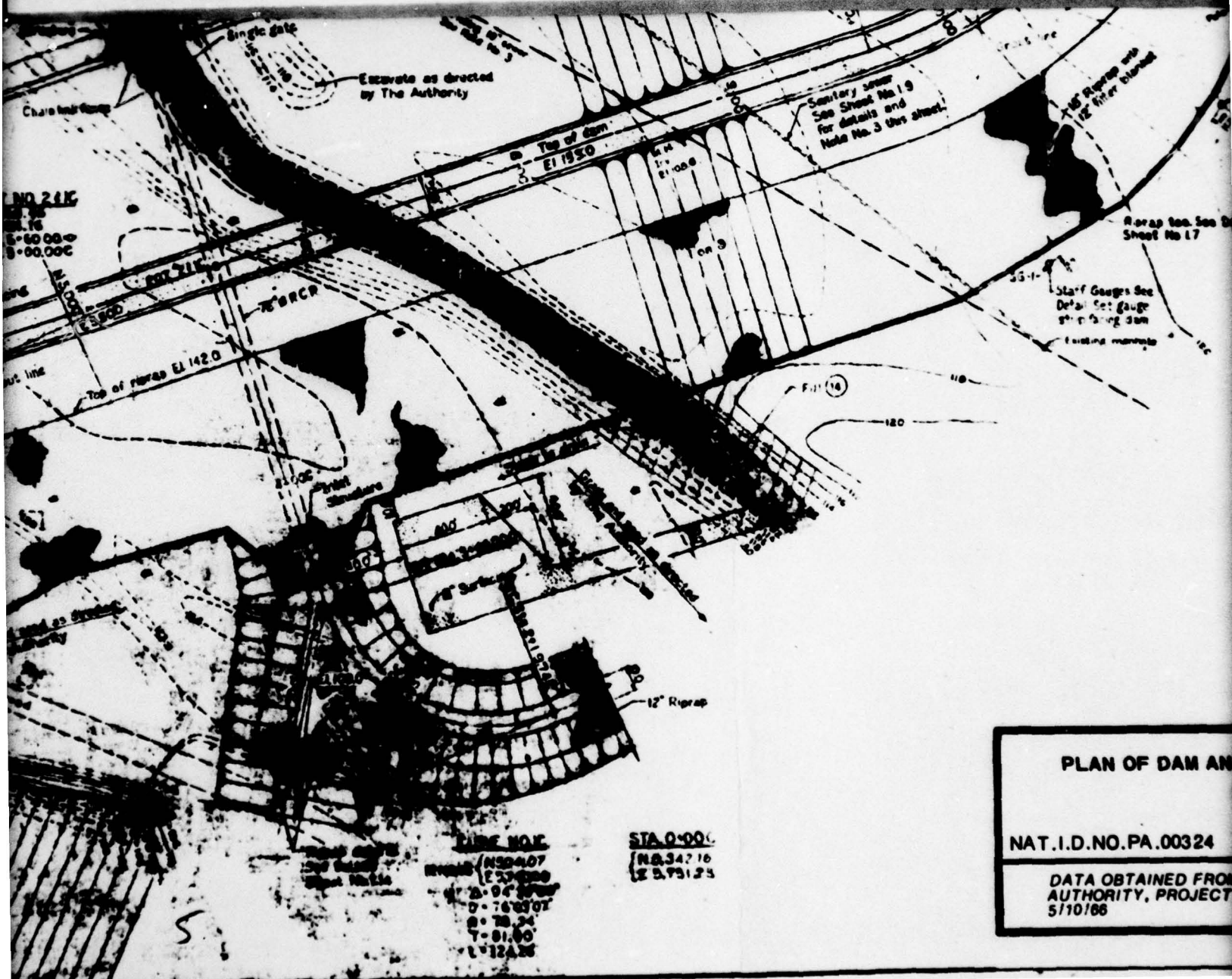
POT 2

POT 1

POT NO 1
N 43° 31' 15"
E 5356.37
Sta 3+50.225

POT NO 1
N 43° 31' 15"
E 5356.37
Sta 3+50.225

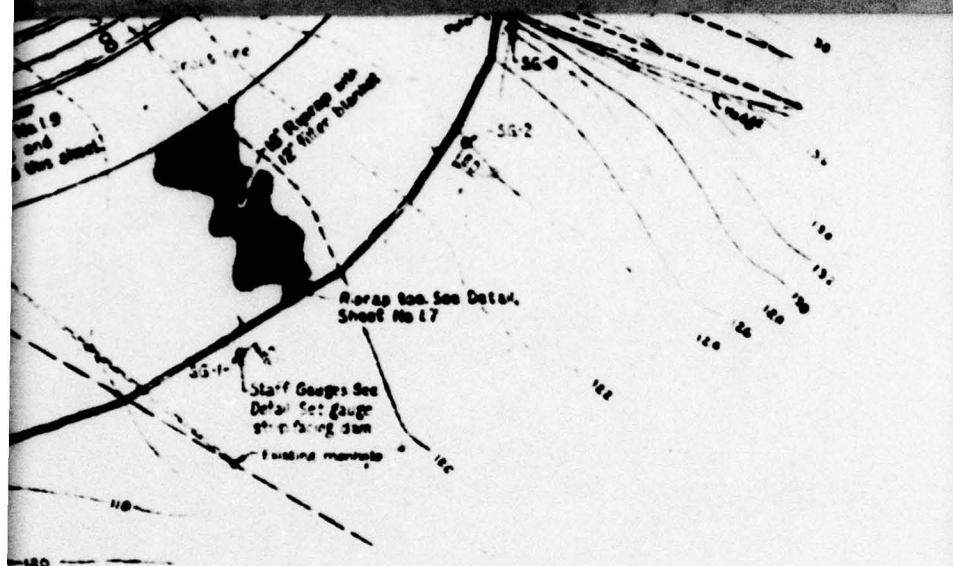




PLAN OF DAM AND

NAT. I.D. NO. PA.00324

DATA OBTAINED FROM
 AUTHORITY, PROJECT
 5/10/66



PLAN OF DAM AND APPURTENANT STRUCTURES SAW MILL DAM

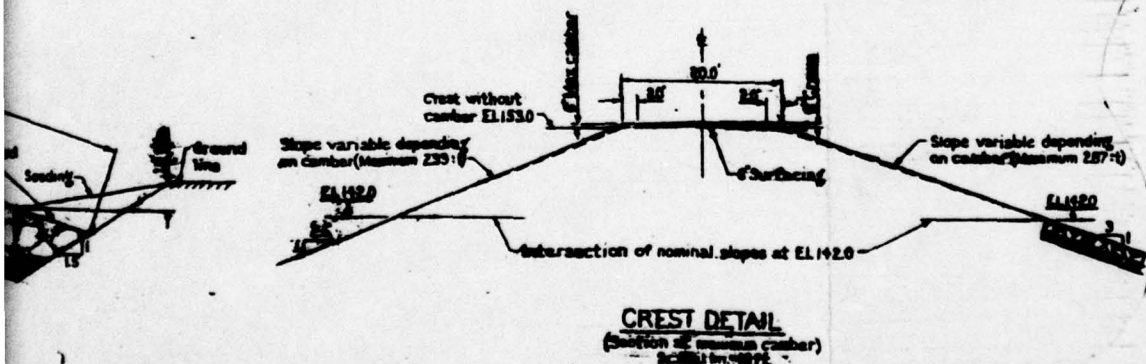
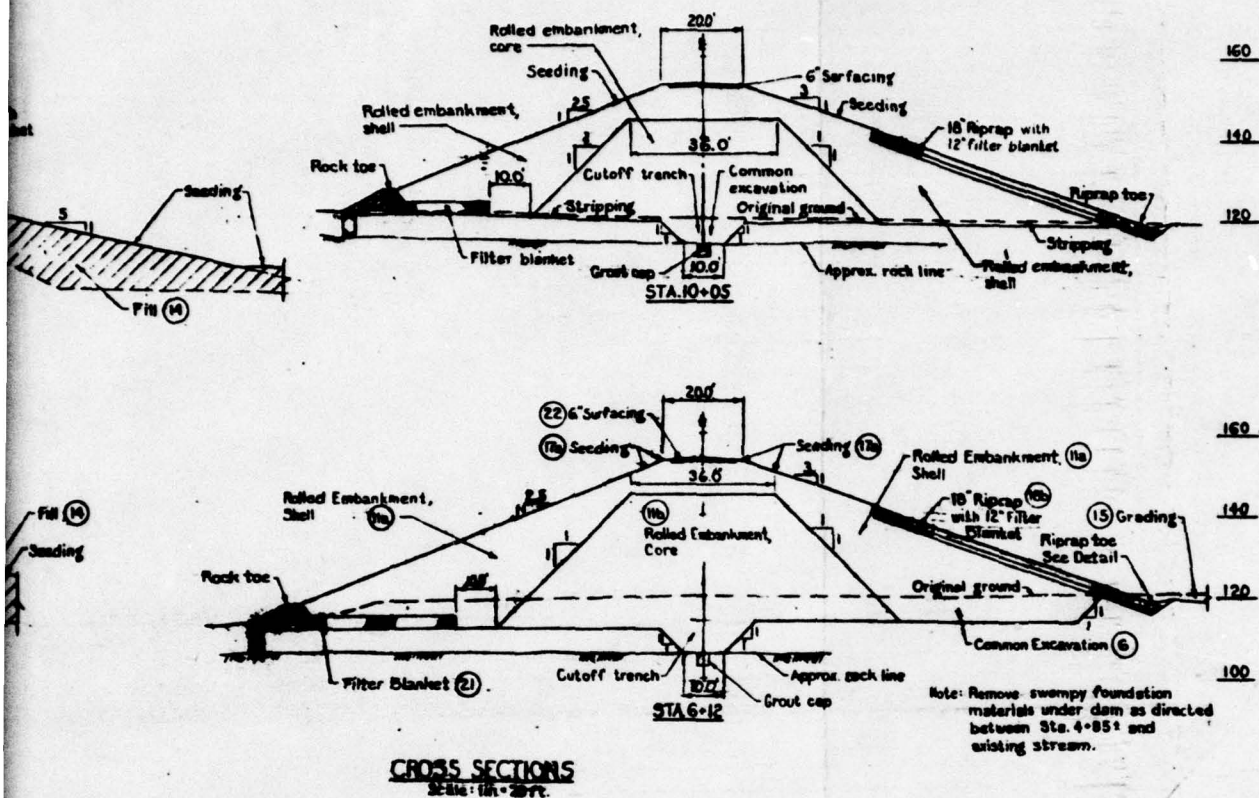
SAW MILL DAM

NAT.I.D.NO.PA.00324

MONTGOMERY COUNTY

DATA OBTAINED FROM THE PENNSYLVANIA GENERAL STATE
AUTHORITY, PROJECT NO.182 - 1, SHEET NO. 1.8, DATED
5/10/66

PLATE 2



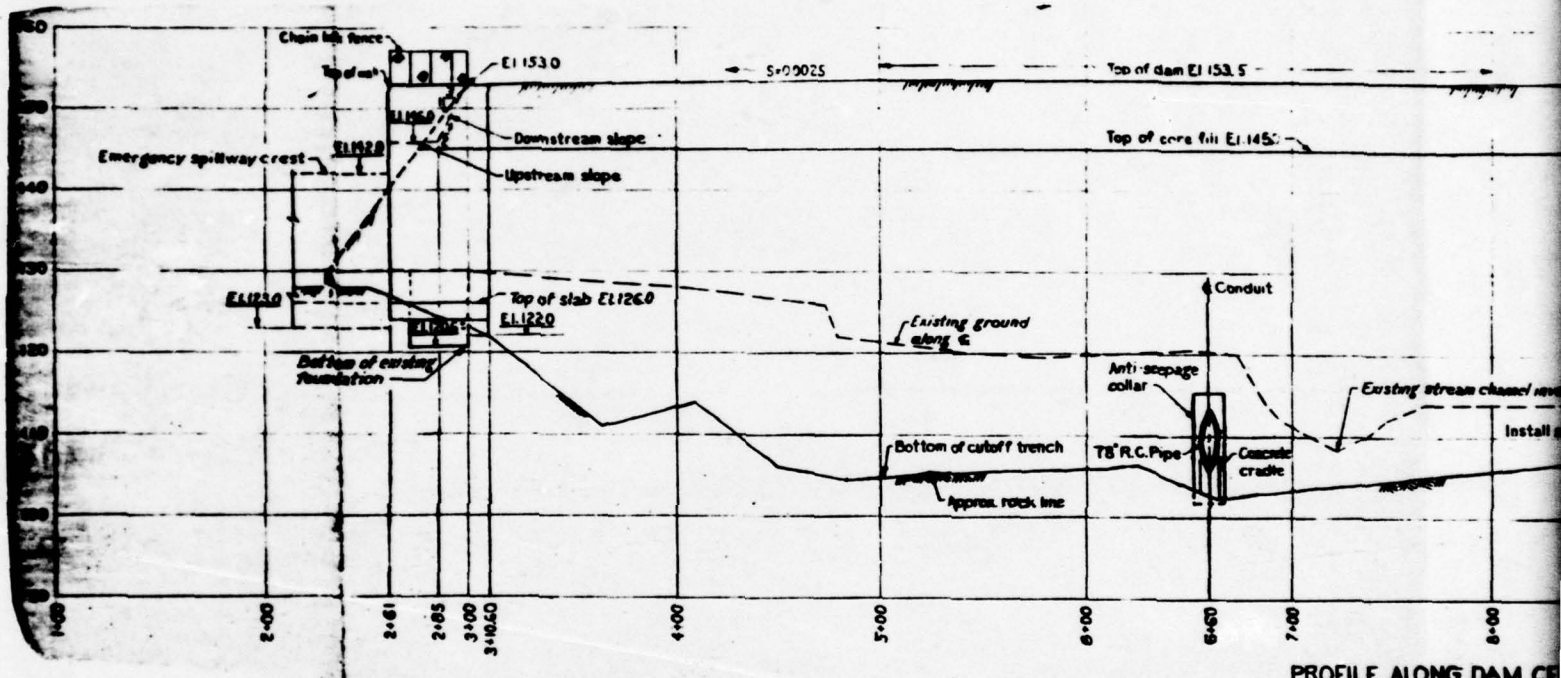
TYPICAL EMBANKMENT SECTIONS SAW MILL DAM

NAT.I.D.NO.PA.00324 |

MONTGOMERY COUNTY

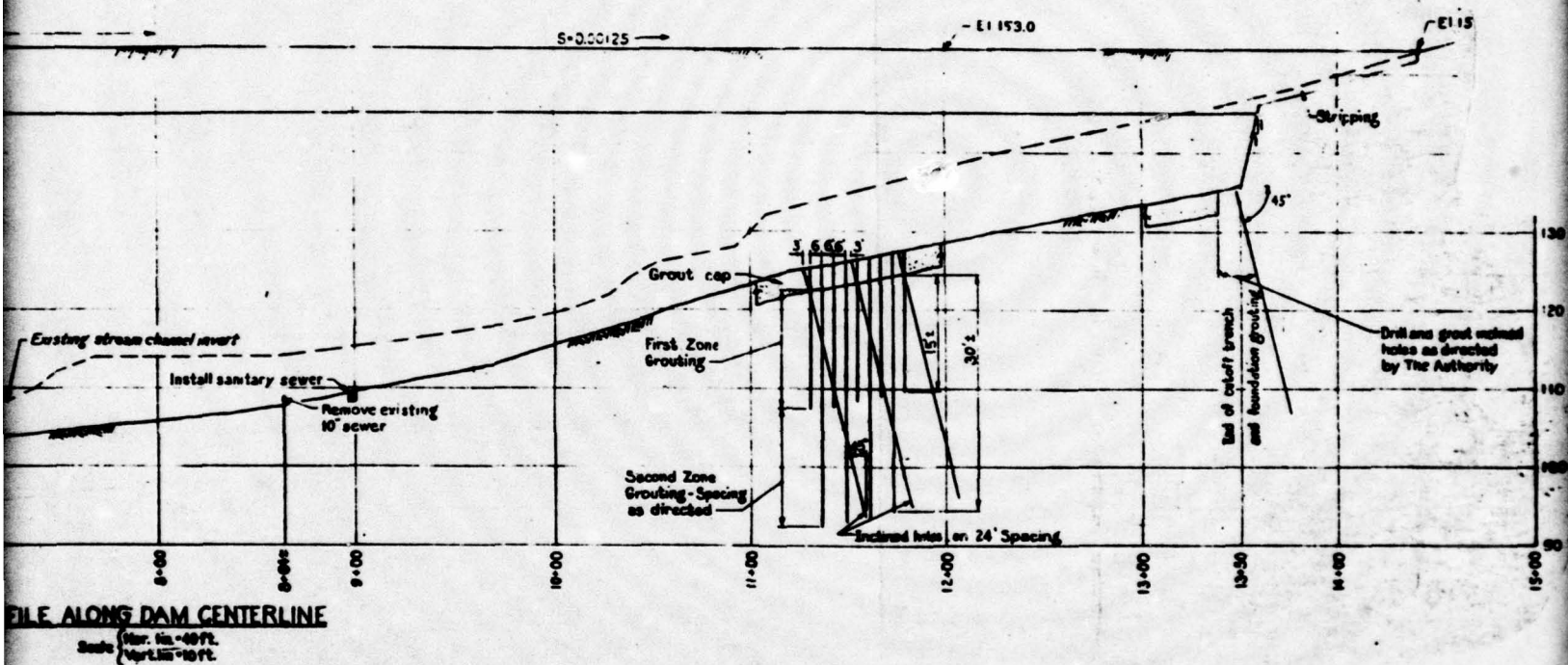
DATA OBTAINED FROM THE GENERAL STATE AUTHORITY, DEPT. OF
FORESTS AND WATERS, DIVISION OF FLOOD CONTROL, PROJECT NO.
GSA-182-1, SHEET NO. 1.7, DATED 5/10/68

PLATE 3 |



PROFILE ALONG DAM CREST

Scale (Hor. 1 in. = 40 ft.
Vert. 1 in. = 10 ft.)



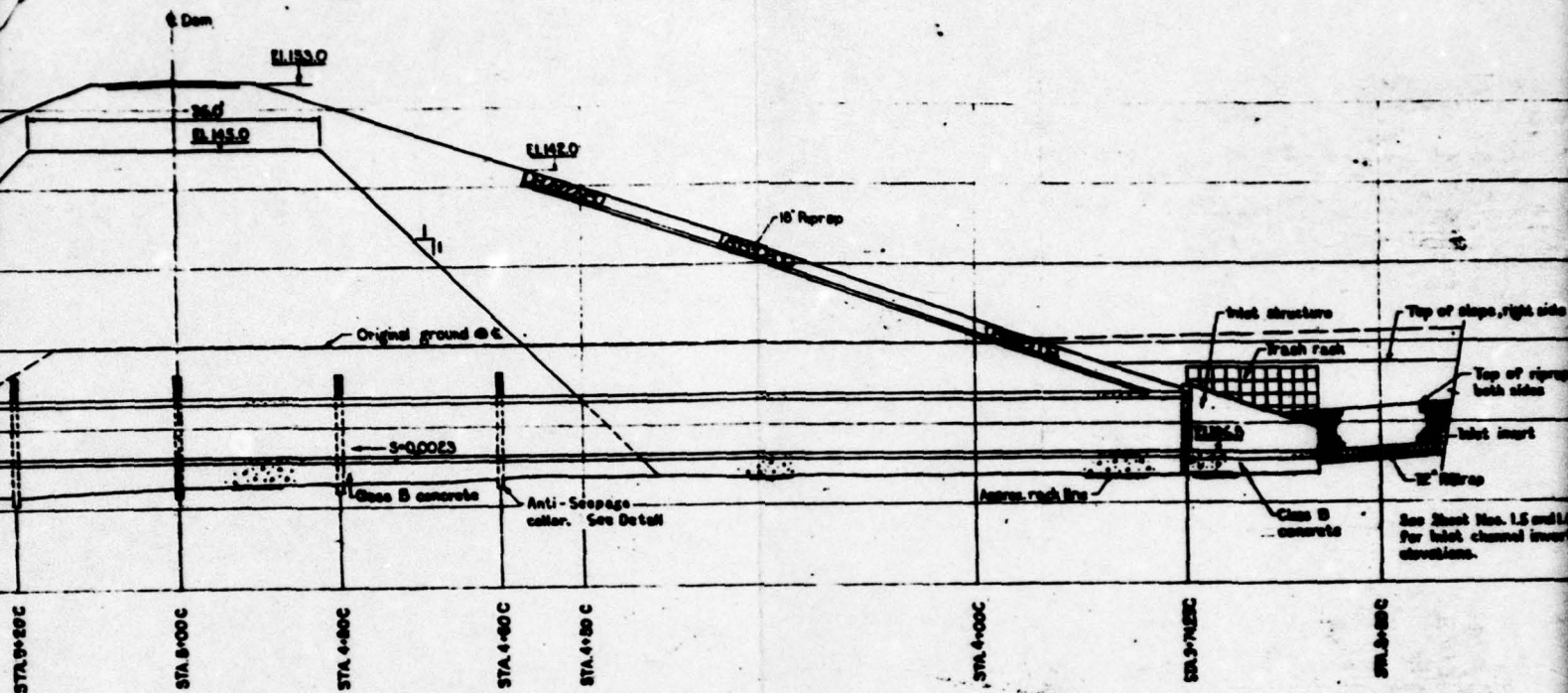
CENTERLINE PROFILE AND GROUT CURTAIN SAW MILL DAM

NAT.I.D.NO.PA.00324

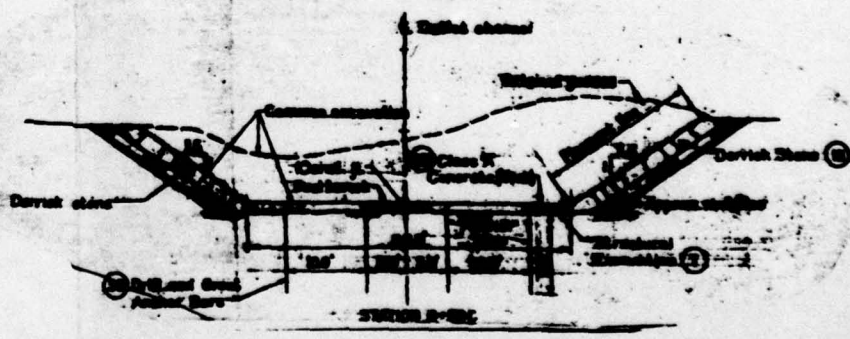
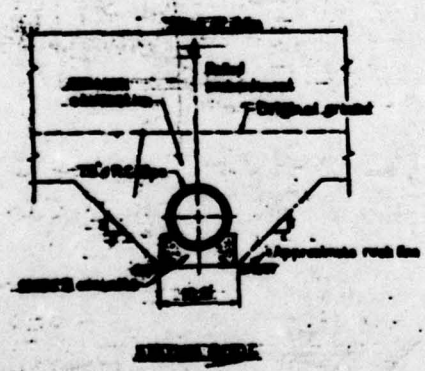
MONTGOMERY COUNTY

DATA OBTAINED FROM THE GENERAL STATE AUTHORITY, DEPT. OF
FORESTS AND WATERS, DIVISION OF FLOOD CONTROL, PROJECT NO.
GSA-182-1, SHEET NO. 1.7, DATED 5/10/66

PLATE 4



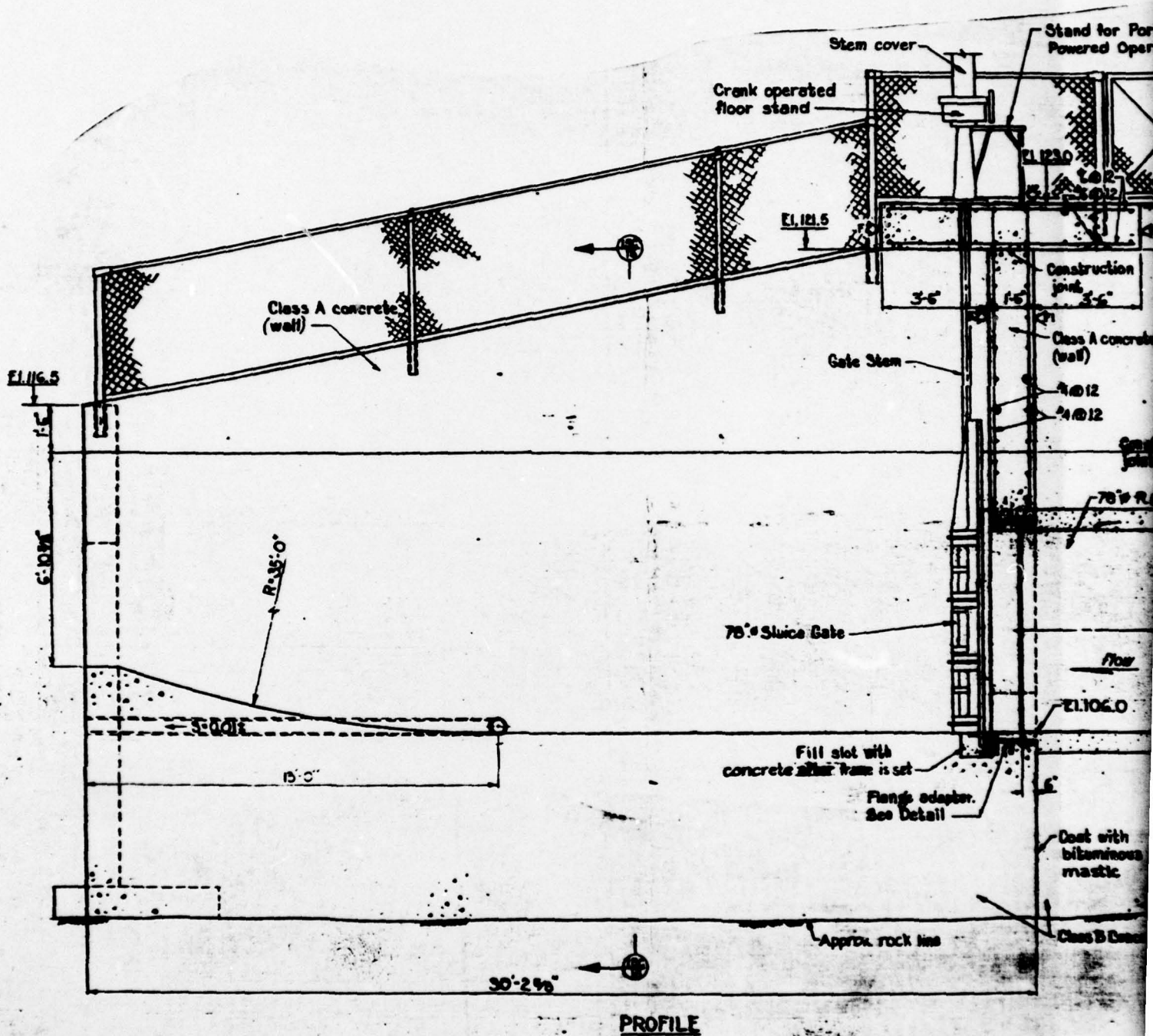
PROFILE
Scale: 1" = 40' H.



PROFILE AND SELECTED DETAILS OF OUTLET WORKS SAW MILL DAM

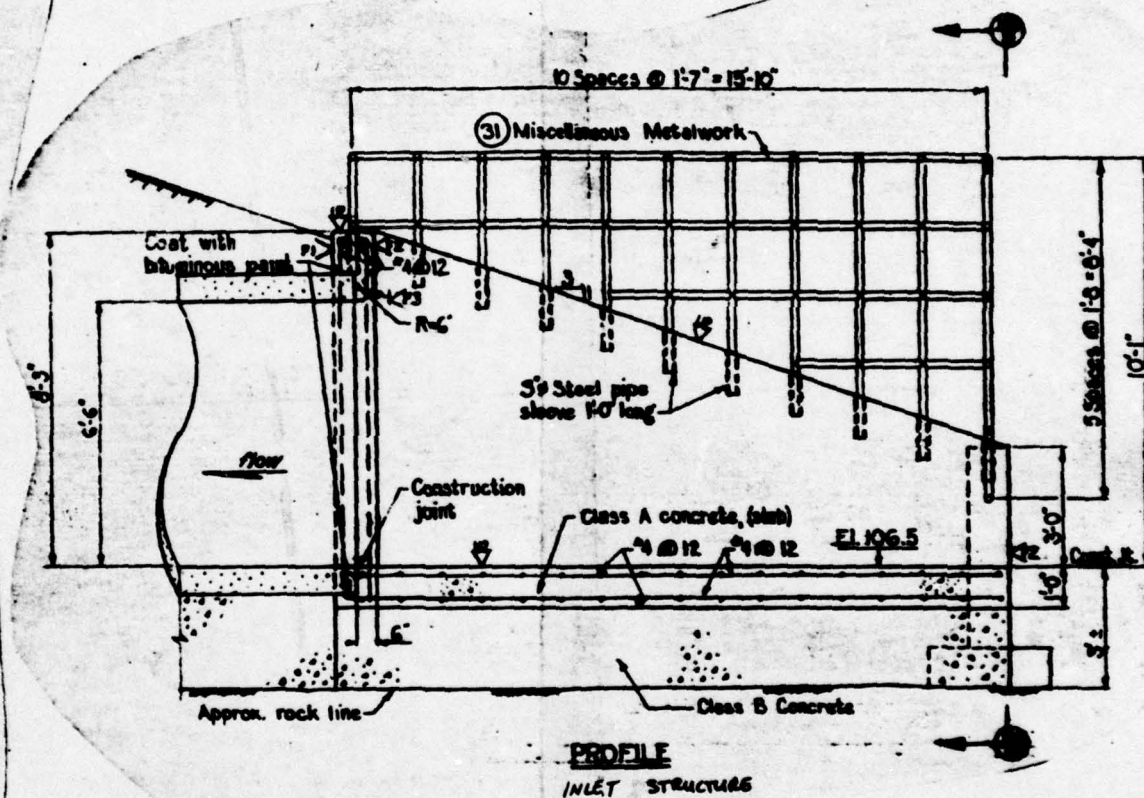
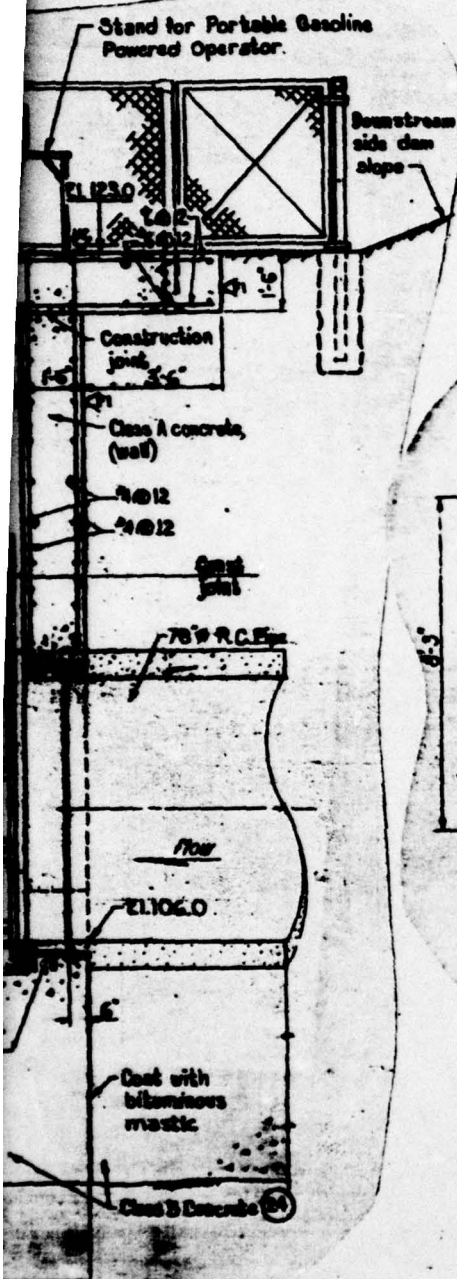
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DATA OBTAINED FROM THE GENERAL STATE AUTHORITY, DEPT. OF
FORESTS AND WATERS, DIVISION OF FLOOD CONTROL, PROJECT NO.
GSA-182-1, SHEET NO. 1.14, DATED 8/10/88



OUTLET STRUCTURE

PROFILE



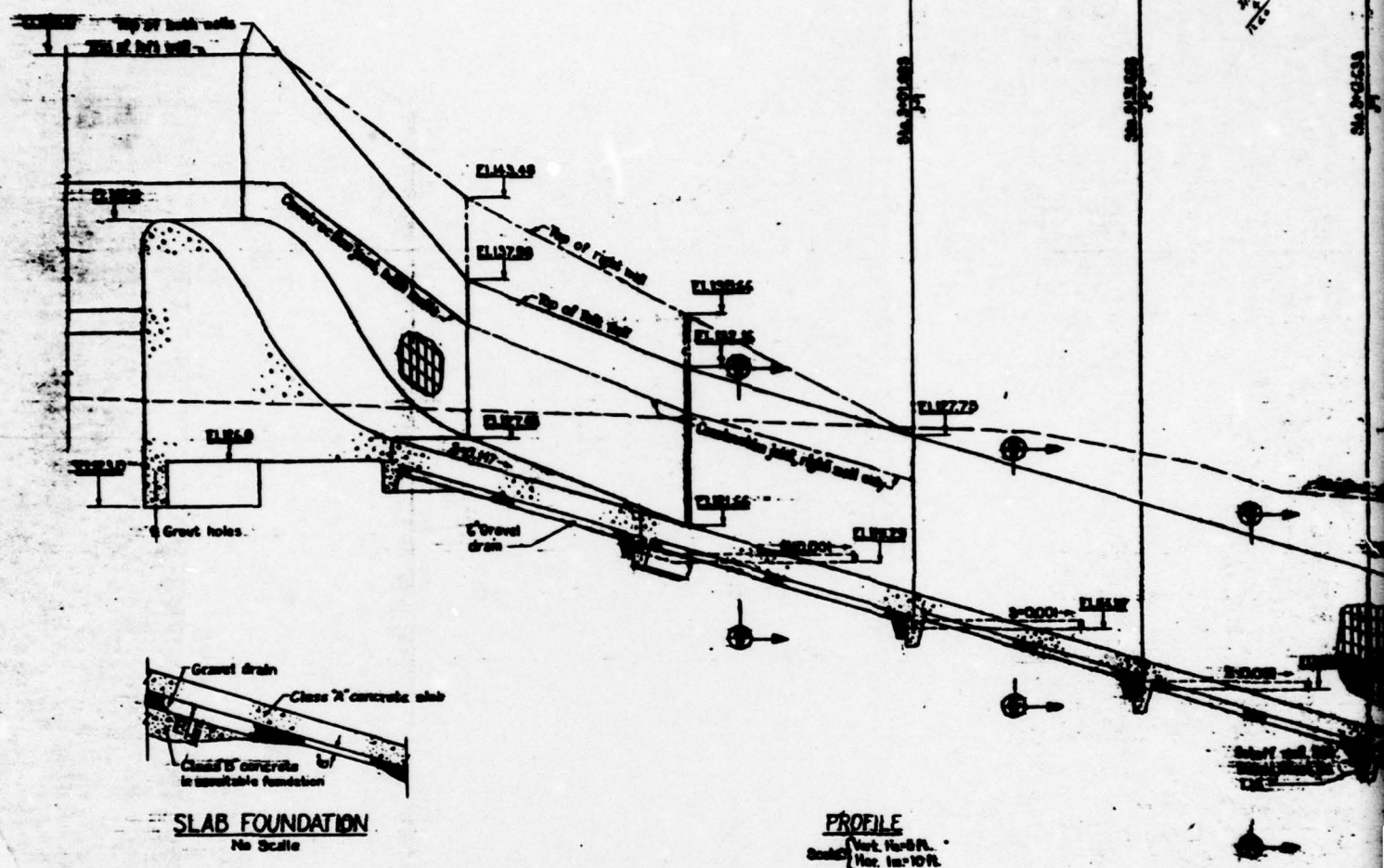
DETAILS OF INLET AND OUTLET STRUCTURE SAW MILL DAM

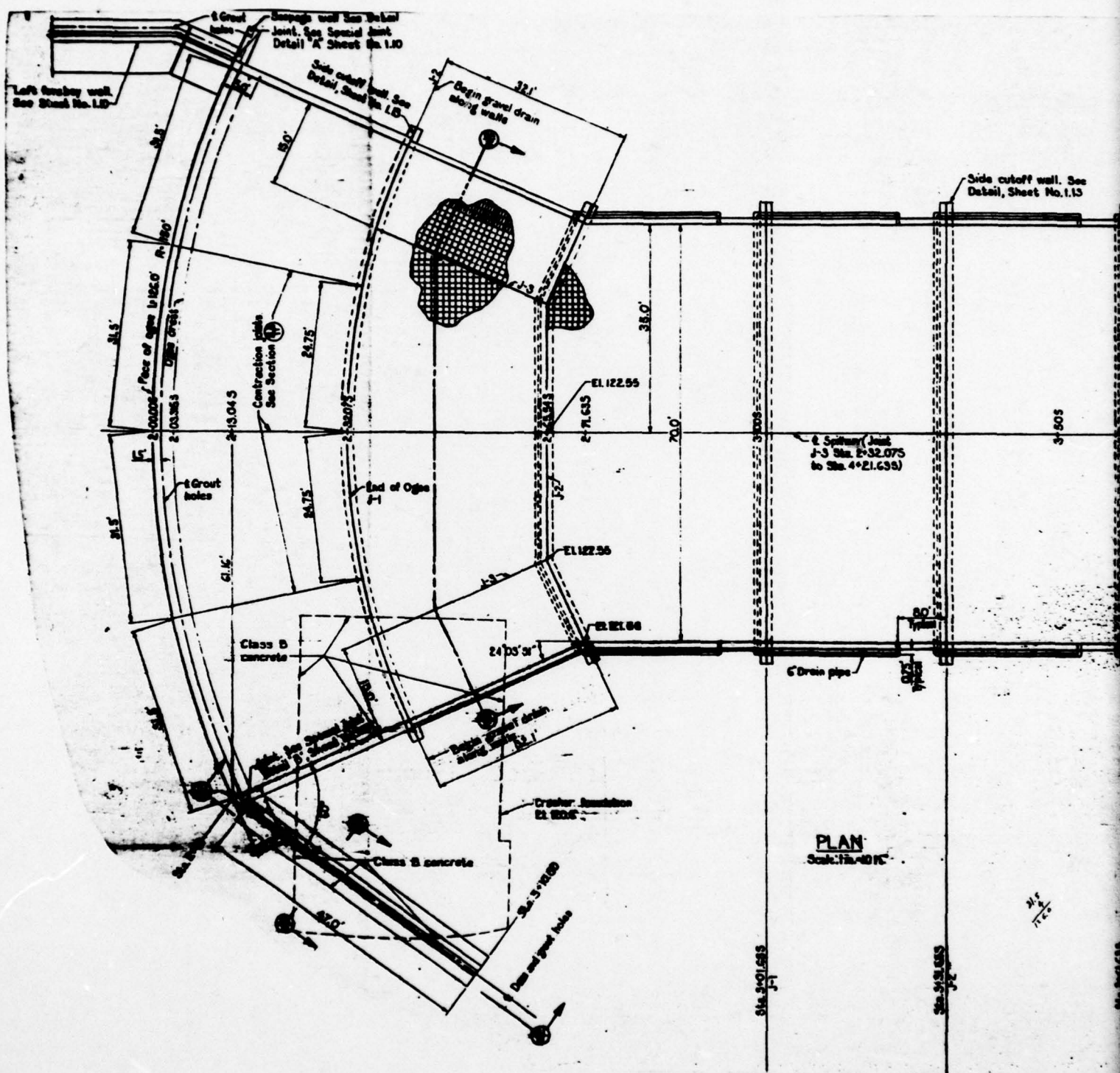
NAT.I.D.NO.PA.00324

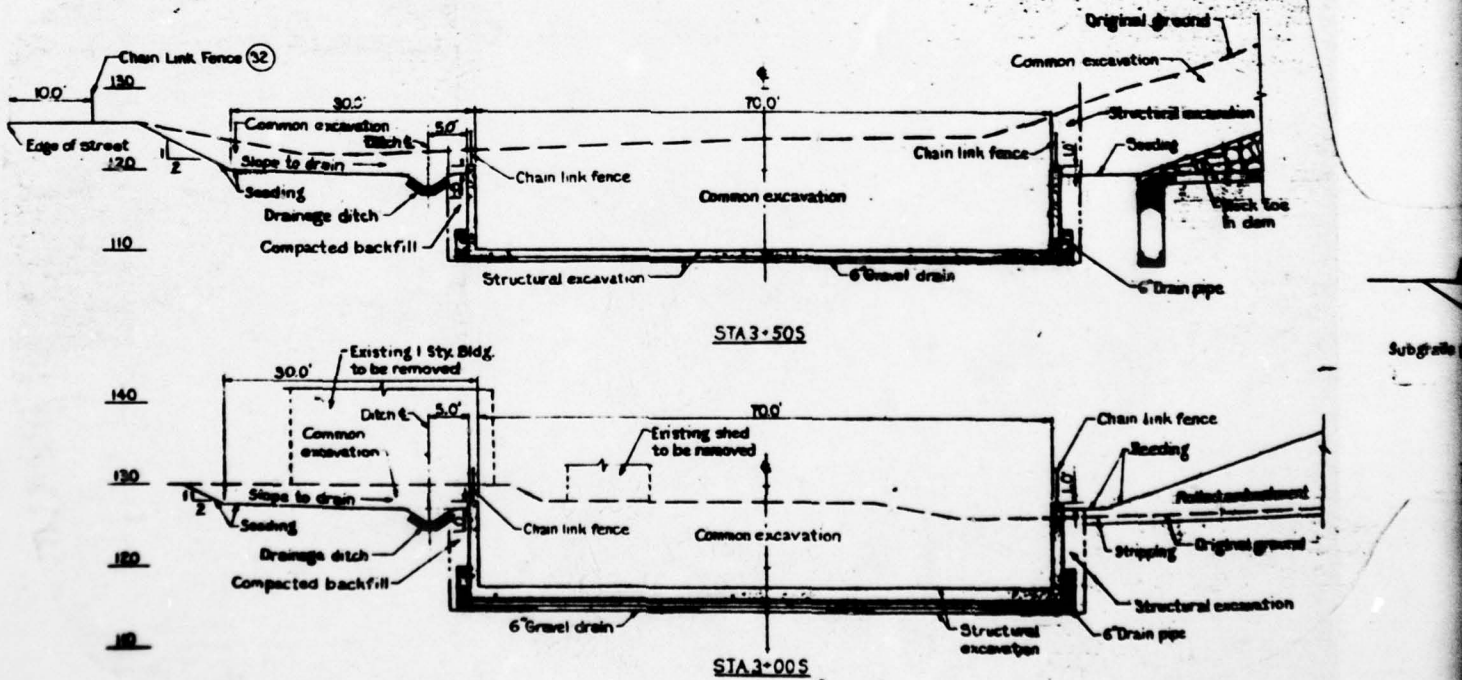
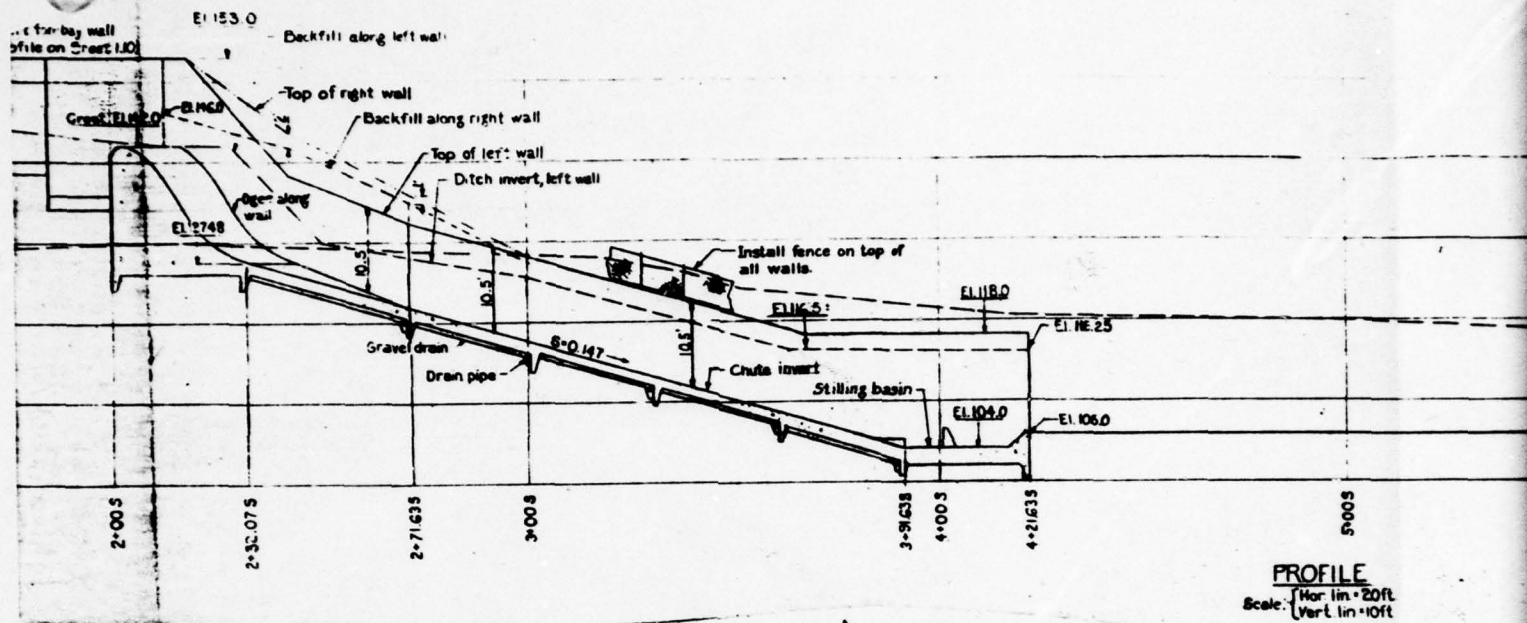
MONTGOMERY COUNTY

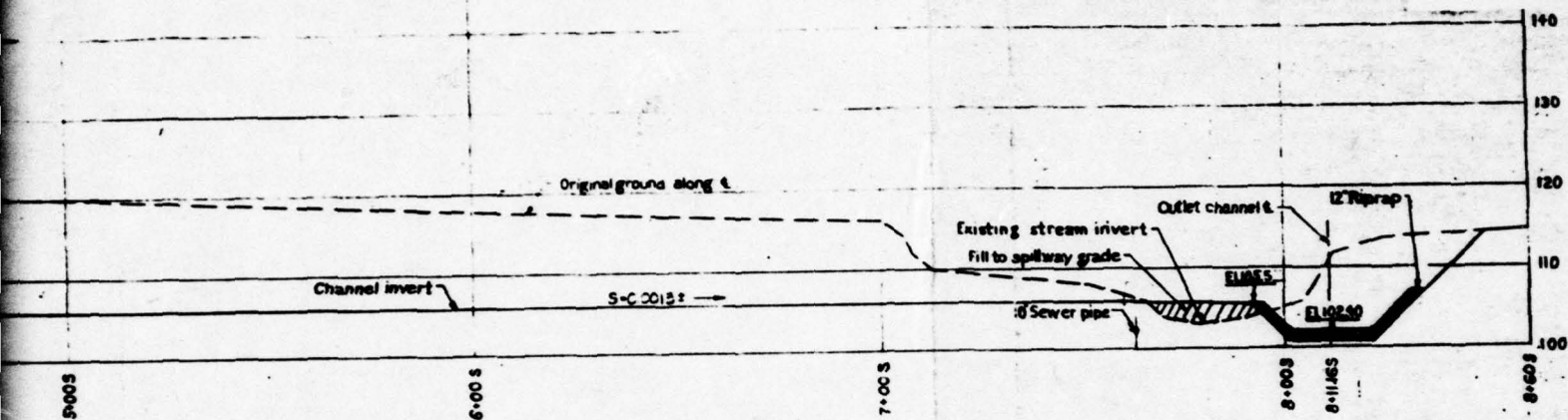
DATA OBTAINED FROM THE GENERAL STATE AUTHORITY, DEPT.
FORESTS AND WATERS, DIVISION OF FLOOD CONTROL, PROJECT
GSA-182-1, SHEET NO. 1.15, DATED 5/10/66

PLATE 6

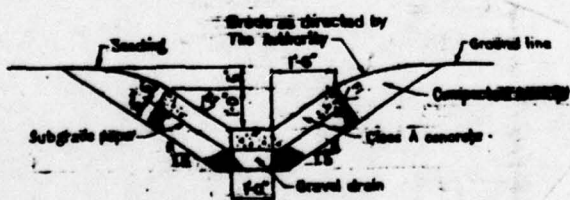








PROFILE
Hor. in. = 20ft
Vert. in. = 10ft



DRAINAGE DITCH DETAIL

SPILLWAY PROFILE AND SELECTED SECTIONS SAW MILL DAM

NAT.I.D.NO.PA. 00324

MONTGOMERY COUNTY

DATA OBTAINED FROM THE GENERAL STATE AUTHORITY, DEPT.
FORESTS AND WATERS, DIVISION OF FLOOD CONTROL, PROJECT
GSA-182-1, SHEET NO. 1.8, DATED 5/10/68

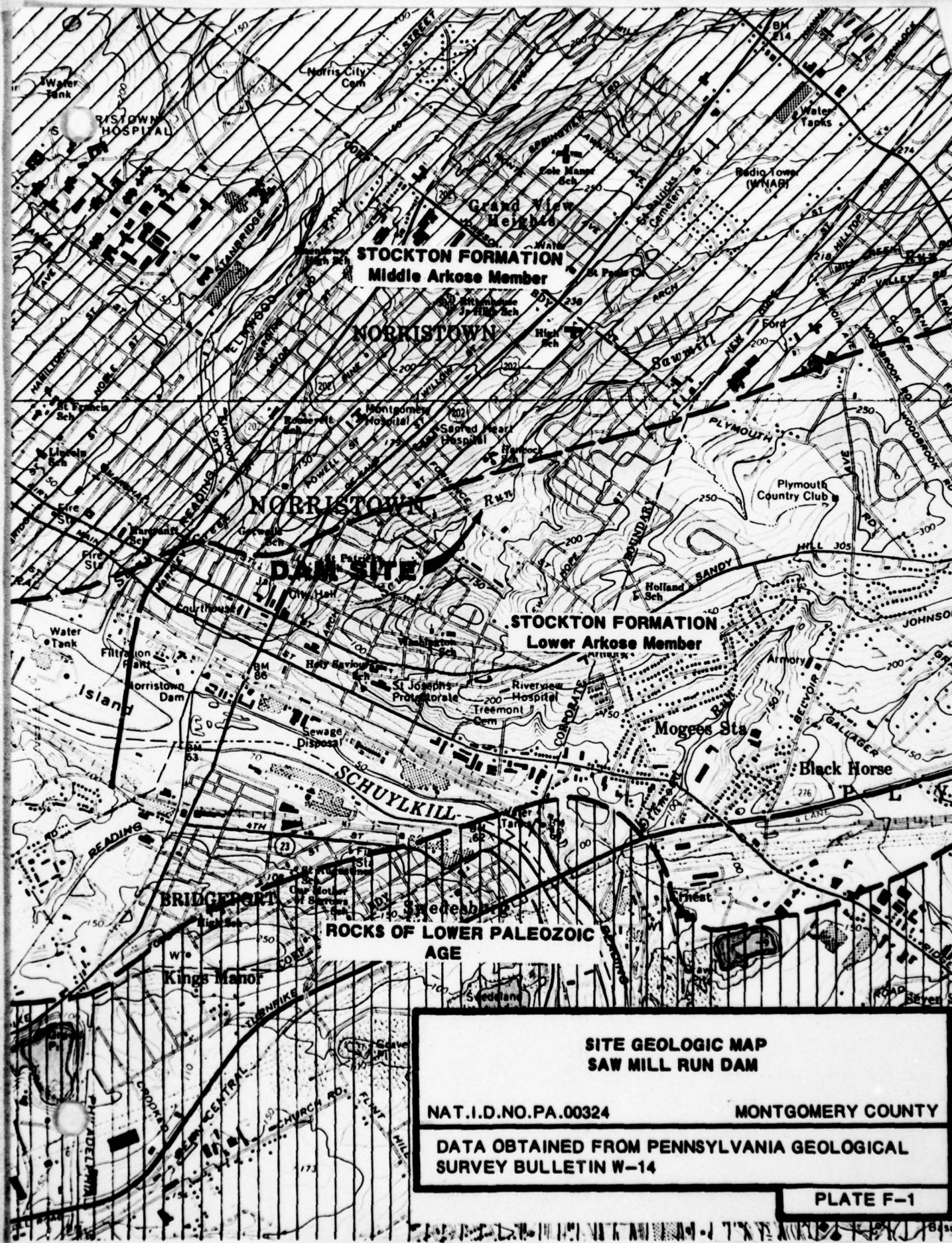
PLATE 8

APPENDIX

F

SITE GEOLOGY
SAW MILL RUN DAM

Saw Mill Run Dam is located in the Triassic Lowland Section of the Piedmont Physiographic Province near the northern limit of the Piedmont Uplands Section. As shown in Plate F-1, the bedrock underlying the dam site area consists of the lower arkosic member of the Stockton Formation of Triassic Age. Located several hundred feet upstream from the left abutment and spillway area are excellent quarry-like exposures of the Stockton Formation. The rock type consists predominantly of a dense, fine to medium grained arkosic (feldspar containing) sandstone with interbeds of less durable shale. Bedding planes generally strike to the northeast and dip approximately 14 degrees to the northwest. A major set of high angle joint planes strike to the north-northeast with a lesser high angle set striking to the northwest. Any potential for water seepage as a result of bedrock features would most likely be related to the joint system orientation.



**SITE GEOLOGIC MAP
SAW MILL RUN DAM**

NAT.I.D.NO.PA.00324

MONTGOMERY COUNTY

DATA OBTAINED FROM PENNSYLVANIA GEOLOGICAL
SURVEY BULLETIN W-14

PLATE F-1